Library

of the

University of Toronto

Digitized by the Internet Archive
in 2013

http://archive.org/details/mechcontract1907toro

2018

PLUMBER & STEAMFITTER OF CANADA

A Weekly Newspaper Devoted to the Plumbers' and Steamfitters' Trades in Canada.

Vol. I. No. 1. (New Series). MONTREAL, TORONTO, WINNIPEG, MARCH 13, 1907. Old Series, Vol. XIX. No. 11

Wrought Iron Pipe and Cast Iron Fittings

Our Stock in these lines is complete. Can fill all orders promptly. Be supplied before the Fall rush commences.

WM. STAIRS, SON & MORROW, Limited, HALIFAX, N.S.

PLUMBING GOODS

And Sanitary Specialties

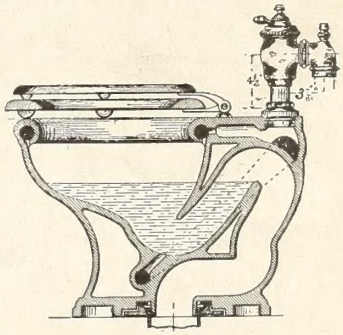
The "Astoria" Low Tank Combination.

"High Grade" Closet Combinations

You may have clients who demand something better than the ordinary—Something that has genuine merit both in efficiency and appearance.

The "**Astoria**" outfit combines these essentials—a Square Back Vitrious-China Bowl with extra large Water Seal, large Noiseless Tank and Saddle Seat—all woodwork Piano Polish.

Also furnished with "Nethery" Patent Flush Valve for concealed Tank supply or direct pressure from main.



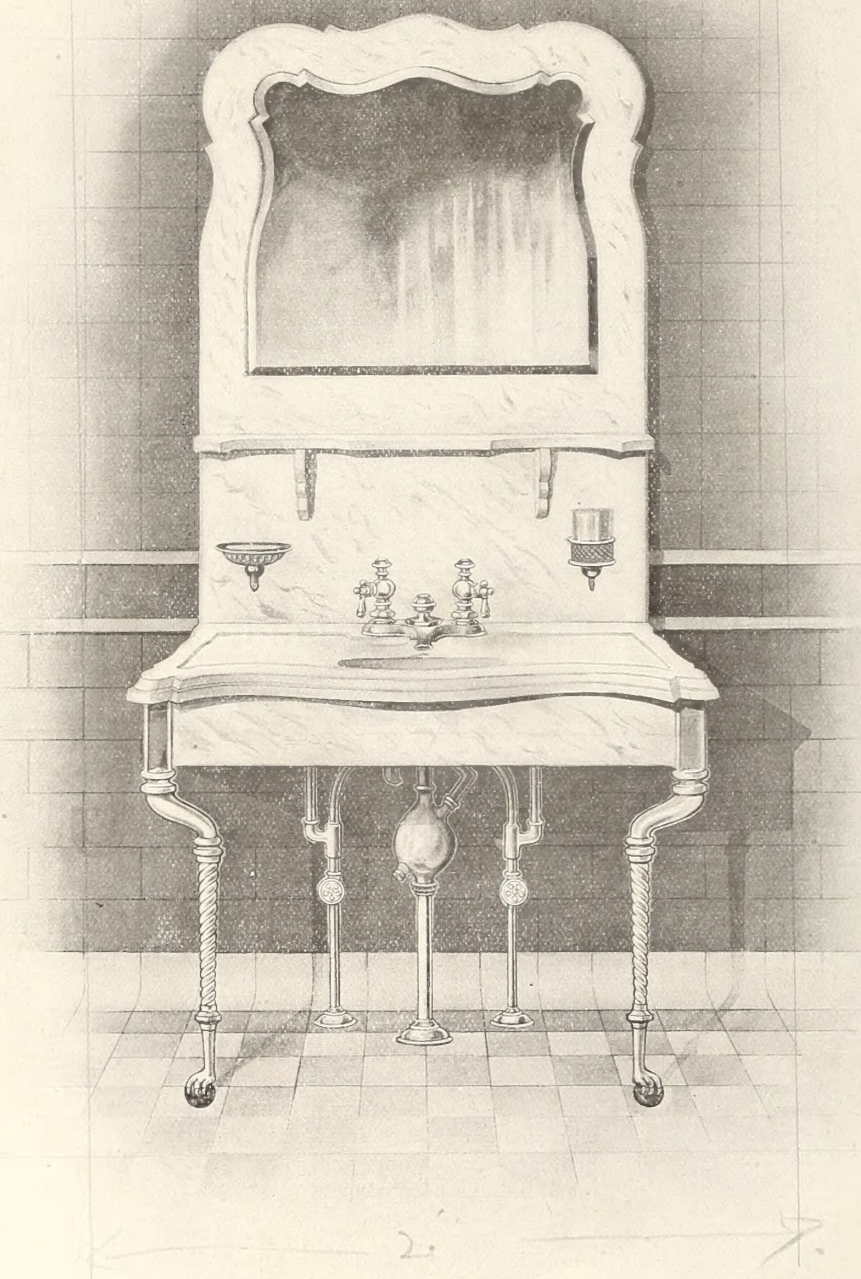
Sectional View of Syphon-Jet Closet with Nethery Valve.

Enameled Baths ***Enameled Lavatories*** ***Enameled Sinks and Laundry Tubs***

The James Morrison Brass Mfg. Co., Limited, 93-97 Adelaide St. W., TORONTO

Manufacturers of the Largest Variety in the Dominion

ROBERTSON'S MARBLE LAVATORIES



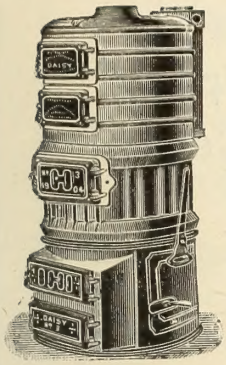
In addition to the goods illustrated, we manufacture and carry in stock a full line of staples, such as Brass Compression, Fuller and Ground Work, Soil Pipe and Fittings, Iron Pipe and Fittings, Engineers', Gasfitters', Steamfitters' and Mill Supplies. A Catalogue for each of these departments will be cheerfully forwarded on application.

The James Robertson Company, Limited

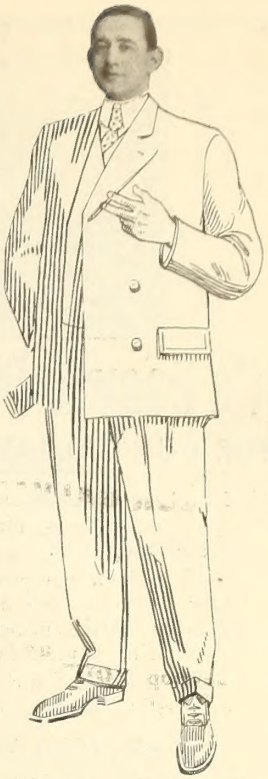
265 King Street West, TORONTO

Synonomous with excellence and completeness in hot water heating is

The Daisy Hot Water Boiler



For over twenty years the Daisy has represented what is best in Hot Water Boiler construction, and hundreds of steamfitters attribute the cause of their success in heating to the unquestioned satisfaction the installation of the Daisy has given.

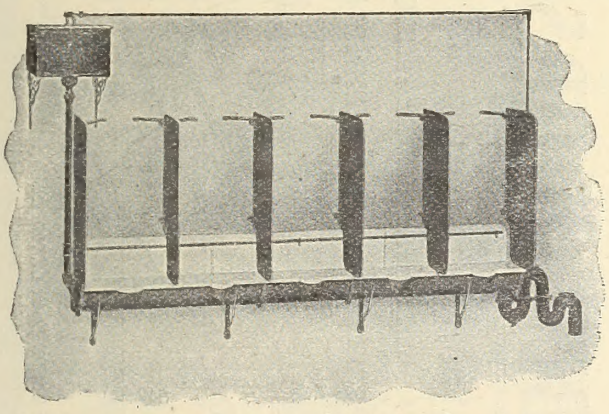


CLUFF BROTHERS

Lombard Street, TORONTO

Selling Agents for - - - WARDEN KING & SON, Limited

A RAPID SELLER



This illustration shows one style of the lavatories manufactured by

THE STANDARD IDEAL CO., Limited

We make a complete line of range-closets, range-urinals, and Sanitary fixtures suitable for public institutions, factories and warehouses. Our goods are stocked by all the leading jobbing houses in the Dominion. There's a reason.

STANDARD IDEAL WARE

is made by a special process which makes the porcelain enameling practically a part of the iron. It has a rich, smooth, snowy opaque appearance. Chaste and artistic in design.
Proper Sanitary equipment is as necessary to the success of a business as modern machinery. STANDARD IDEAL WARE ensures perfect Sanitation-

Send for Catalogue and Price List

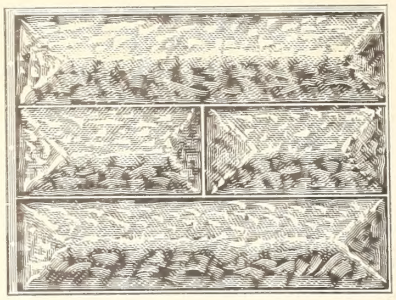
The Standard Ideal Co., Limited

Sales Offices and Sample Rooms, 50 Colborne Street, TORONTO and 128 West Craig Street, MONTREAL

Home Office and Factories, - PORT HOPE, Ont.

SCIENTIFIC DRAINAGE IN CAST IRON
HYGIENIC SANITATION CAN BE OBTAINED BY USING MACFARLANE'S GLASS ENAMELLED DRAIN & SOIL PIPES WHICH ARE RECOMMENDED AND SPECIFIED BY THE LEADING SANITARY AUTHORITIES
HYGIENE
WALTER MACFARLANE & Co.
SANITARY ENGINEERS.
CASTINGS SUPPLIED CUT & FITTED TO REQUIRED MEASUREMENTS
DRAINAGE PLANS ARRANGED
CATALOGUES ON APPLICATION.
SARACEN FOUNDRY,
GLASGOW.

AGENTS :
W. PORTEOUS JACK, 1256 Robson, Vancouver.
GEO. PEATT & CO., P. O. Box 466, Winnipeg, Man.
BAXTER, PATERSON & CO., 102 St. Antoine St., Montreal.



It's Easy to Pick Up Business

FOR OUR GALVANIZED STONE SIDING

Merchants, manufacturers and private citizens find many uses for it in **BUILDING** and **RENOVATING**.

YOU make a nice profit by boosting this line. Our salesmen are always at your service to develop **YOUR** prospects, and our wide-spread advertising is meant to help **YOU**.

YOU will like our dealings. Send us your orders, and let as show you how

"WE WORK WITH THE TRADE"

The Metal Shingle & Siding Co. Limited

PRESTON, ONT.

MONTREAL FACTORY, Cor. St. Catherine and Delorimier Sts.

SALES AGENCIES

ST. JOHN, N.B.	QUEBEC	WINNIPEG	CALGARY
Emerson & Fisher	J. A. Bernard	Clare & Brockest	Ellis & Grogan

ESTABLISHED 1795

JOHN SHAW & SONS

WOLVERHAMPTON, Limited

WOLVERHAMPTON

Cast Iron Soil Pipe
Cast Iron Water Pipe } ALL SCOTCH
Fire Bricks **Cement**

JAMES BARBER, Era Works, Sheffield

HIGHEST GRADES OF

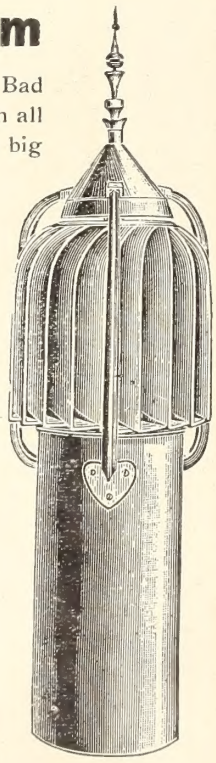
TABLE and POCKET CUTLERY, RAZORS, CARVERS, Etc.

J. H. ROPER

CANADIAN REPRESENTATIVE

82 St. Francois Xavier St., - **MONTREAL**

That Stuffy Room



is more deadly than disease itself. Bad air is the curse of crowded living. In all public places such as asylums, clubs, big offices, schools and theatres, **PURE AIR CAN BE OBTAINED ONLY BY OUR SYSTEM OF VENTILATION.**

It has stood the tests of scientific experts.

It is in use in the finest buildings in Canada.

Its price is reasonable and its benefits lasting.

Testimony:

MONTREAL, June 7th, 1901.

Messrs. J. W. HARRIS CO., LIMITED,
Montreal

Dear Sirs,

I have been using your "AEOLIAN" Ventilators on several houses in this city with the best results. The tenants of these houses declared that your Ventilators are of great advantage to them. I also installed two (2) 18 in. on my stable and I can say that your Ventilator cannot be surpassed by any to take out the sweating or bad smell in any room.

F. D. MONK.

Ask for booklet re Aeolian and Zephyr Ventilators, also booklet on Filter, etc.

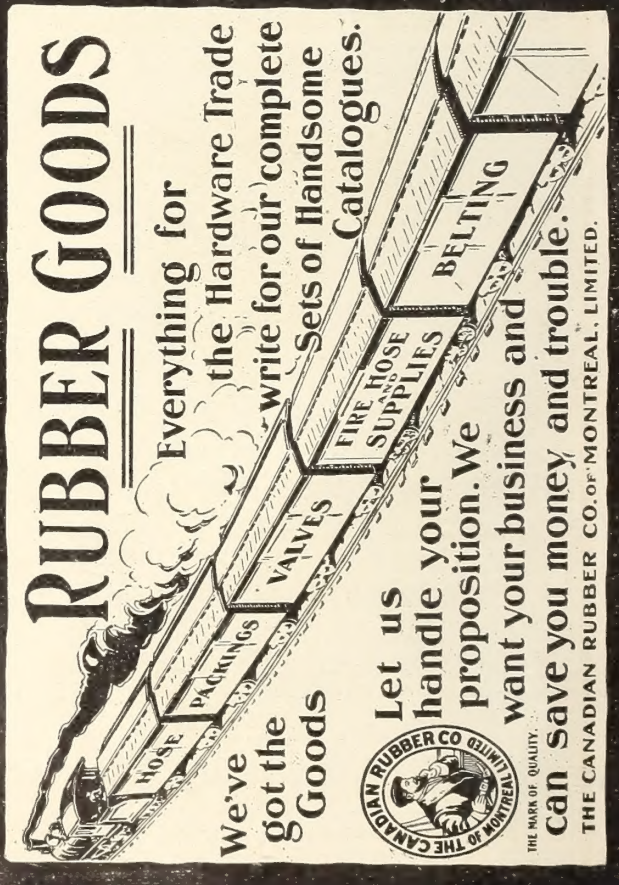
The J. W. HARRIS CO., Limited

Contractors and Manufacturers - ***MONTREAL***

RUBBER GOODS

Everything for the Hardware Trade

write for our complete Sets of Handsome Catalogues.



We've got the Goods

Let us handle your proposition. We want your business and can save you money and trouble.

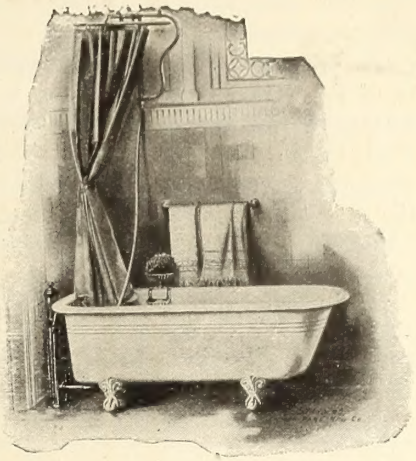
THE CANADIAN RUBBER CO. OF MONTREAL, LIMITED.

CANADIAN RUBBER CO OF MONTREAL LIMITED

THE MARK OF QUALITY

ENAMELWARE HEADQUARTERS

Baths
Sinks
Lavatories
Range Closets
Range Urinals



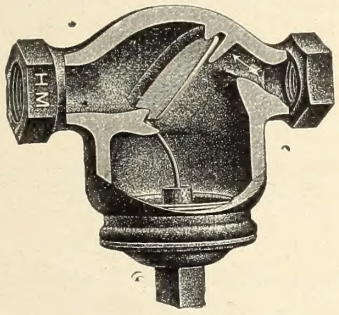
Our New Prices Will Interest You

SOMERVILLE LIMITED

59 RICHMOND STREET EAST **Toronto**

Mueller Water Strainer

PATENTED



—103

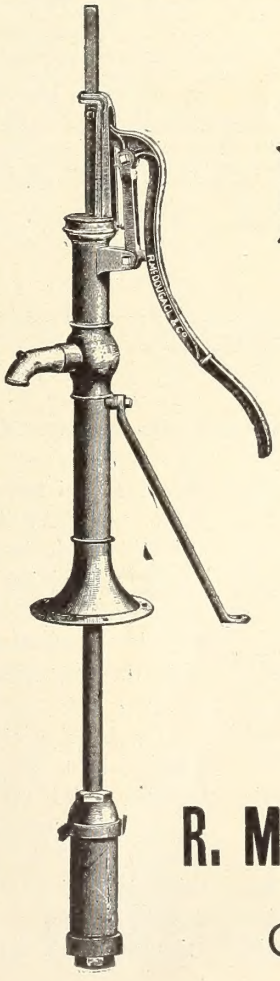
Foreign matter can't cling to the screen in this strainer and choke it. A baffle plate at the inlet receives the first impact of foreign matter and deflects it past the screen into the pocket. Made in regular pipe sizes up to 3-inch and in larger upon order.

UNCONDITIONAL GUARANTEE

THE MARK OF DECATUR H M ILL. U.S.A. REGISTERED TRADE MARK MUELLER GOODS

H. MUELLER MFG. CO.

Decatur, Ill., U.S.A. ***New York N. Y., U.S.A.***



Ask any Pump Man

who has ever used our Fig. 92, and if he does not say "it is the best ever," then we will acknowledge "the exception which proves the rule." There is no use looking for anything better than we have in our catalogue and prices must, of course, be right, as well. Let us have a little talk together.

THE

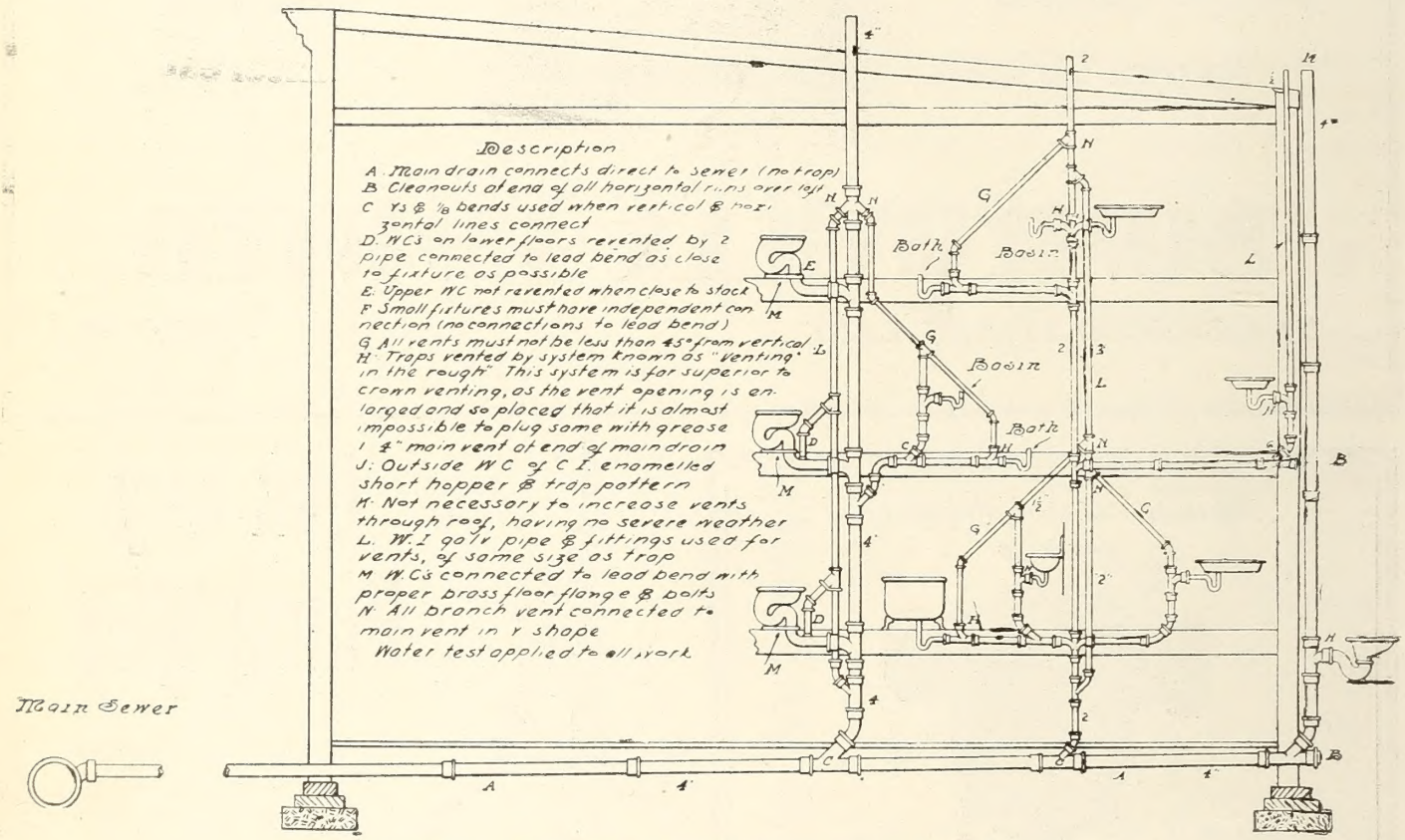
R. McDougall Company,

LIMITED

GALT, CANADA

Excellent Work in British Columbia

Some work approved by President Davis, of the Plumbing Inspectors' Association of America, has encouraged "A. S.," of Victoria, B.C., to write describing a job done by him in that city, the work differing materially from that approved by Mr. Davis, although being of a similar nature. The job was in a tenement building in Victoria, where the system of venting is what is termed venting in the rough, and from the Victoria point of view is the best yet adopted by any city on the continent.


Description
A. Main drain connects direct to sewer (no trap)
B. Cleanouts at end of all horizontal runs over 10'
C. 1/4 & 1/8 bends used when vertical & horizontal lines connect
D. WCs on lower floors rerented by 2" pipe connected to lead bend as close to fixture as possible
E. Upper WC not rerented when close to stack
F. Small fixtures must have independent connection (no connections to lead bend)
G. All vents must not be less than 45° from vertical
H. Traps vented by system known as "venting in the rough" This system is far superior to crown venting, as the vent opening is enlarged and so placed that it is almost impossible to plug same with grease
I. 4" main vent at end of main drain
J. Outside WC of C.I. enamelled short hopper & trap pattern
K. Not necessary to increase vents through roof, having no severe weather
L. W.I. 90° pipe & fittings used for vents, of same size as trap
M. W.Cs connected to lead bend with proper brass floor flange & bolts
N. All branch vent connected to main vent in Y shape
Water test applied to all work
Bath
Basin
Main Sewer

An Excellent Piece of Plumbing Work Recently Done in Victoria, British Columbia.

A Practical Letter.

"According to the plumbing and sewerage by-laws all main and branch sewers under a building must be of a soil pipe termed extra heavy. The sizes of same will be given in the plan of building just completed and approved by our plumbing inspector, H. Shade, who is a practical man for the position he occupies, having passed a strict examination in practical and theoretical work, including plan drawing, before receiving his appointment. Under his supervision we have a set of plumbing by-laws which the practical plumber is proud of. According to them all plumbing work must be subject to the following tests:

"At the completion of the roughing in of the work all ends of wastes must be plugged and a water test of not less than fifteen pounds be given to the work before calling in the inspector for the first examination. If everything is tight you may then start in to instal your fixtures, and as soon as this is done the final test is given by using the smoke test. At the completion of this a certificate is issued from the inspector's office giving a guarantee to the property owner that the work is in first-class condition, and is in compliance with the city plumbing and sewerage by-laws.

"I am giving this general routine of work so as to compare same with work in other cities, for, after studying some of the working plans in plumbing, I have come to the conclusion that something is radically wrong with the system in having so many different varieties of work, as anyone who studies the problem must realize that there is one goal and that is perfection. How much easier it would be for the plumber who travels from north to south, east to west, to be familiar with his trade, so that should he be in Chicago one week and land in Victoria the next he could take his position along with his fellow employees and go to work without having to study the by-laws and learn the trade over again.

"From my own experience as an employer of labor I find that a universal by-law is what is needed, so that we may be able to kill the sewer pipe monopolists, et al., who are holding Chicago by the throat at the present day for the lust of gold. 'Let the people die from bad plumbing and sewer work, the plumber will get the blame anyway; and we can sit in our armchairs and gather the shekels in,' says the sewer pipe combine of Chicago.

"But there are other questions nearer home to the plumber which ought to be considered seriously, and one is, that when a building is being erected, generally speaking, no provision is made

for the piping unless you can squeeze everything between the studding or expose the piping on the outside. In milder climates, such as we have in Victoria, the latter course is generally adopted, but in the eastern states I have noticed the soil pipes and wastes are exposed inside the building, which gives a very bad impression to the owner. The architect provides a place for the fixtures, but forgets that there are soil pipes to be taken to them. Were the plumbers to put their heads together this would not be the case, and better satisfaction would be given the owner and the trade in general raised a notch higher, for it is every move that counts.

Vent Pipes Clean Themselves.

"In my accompanying plan you will notice that all venting is done perpendicularly or at an angle of 45 degrees. The reason for this is to give all vent pipes an opportunity of cleaning themselves directly into the main soil pipes, and I think you will agree with me that this is a good law. In most of the cities of the United States I find that they allow horizontal runs of vent pipes, which must be condemned by anyone who studies the question of venting.

"Did ever any of the trade take the trouble to inquire into old work that they have taken out, and see whether it was full of rust or scales, generally at the elbows? If not, try it the next time. The coal fumes and acids from factories may have a good deal to do with this, but as long as the easy plumber gives those factories the opportunity to do so by this system of horizontal venting just so long will the defect remain. It is one thing to do a job and have it give satisfaction for the time being, but it is another to have the same job give satisfaction for all time to come.

"Another point I might touch upon is the system of direct connection to the sewer versus the intercepting trap. Some engineers take exception to the direct system, but I have yet to see the city adopting such that ever went back to the intercepting trap, and I have been informed of many who have adopted the direct after experiencing the indirect. Those who have adopted the intercepting trap must have found out by this time that the stoppage in any sewer is generally from this, and then the smell from the streets where the vents for flushing the main sewer are is enough to knock you down. If it is good to vent and take off the smell from your own sewerage until it passes your property, is it not just as well to vent until it passes out to the sea?

"Think it out, fellow craftsmen, and let us have your opinion. That is what I am writing this article for. My ambition is to see the plumbing fraternity recognized as men of culture in whatever community they may reside, in company with doctors, lawyers and preachers, using the Golden Rule at all times for the benefit of their less informed fellow citizens."

A Discussion Suggested.

This is an interesting letter and we will be glad to give space to the comments of anyone in the trade on the system outlined and views advanced. The Plumbers' Trade Journal of New York, by whom the letter was published a month ago, added the following comment, which covered the several points raised very completely and concisely:

"As we look at it, the elevation of plumbing work as done in Victoria, which correspondent submits, shows an excellent piece of work. The system which he calls 'venting in the rough' is certainly, he suggests, the best that has yet been adopted. This system has been referred to in the columns of the Journal as 'continuous venting,' and the advantages of the system and many illustrations of it have often been brought to the attention of our readers. It appears to us that it is only question of time before our cities will adopt this method very extensively.

"The correspondent's remarks on the architect bring up again the question which has often filled every plumber with dismay. It is an old subject, one upon which much has been written, but we do not see that much headway is being made, and it strikes us that it is a difficult matter to adjust. In the layout of our large public buildings architects are often employed who have in their service experts on the various lines of construction, and under such such conditions it is usually to be observed that the arrangements for properly installing the piping are far better than in those buildings designed by the architect who employs no such assistants, and who has little or no knowledge of practical plumbing installation. Until the architect is educated along this line we do not see that conditions will change, unless, indeed, the architect can ever be persuaded to come down from his dignity sufficiently to allow himself to consult with tht plumber regarding the layout of this part of the work.

Hard to Harmonize.

"As to a universal plumbing ordinance, we believe that it would be a splendid thing; but probably as unattainable as it is splendid. In the first place, our correspondent would not want to see the intercepting trap appear in that universal law. The other fellow would want it there. Our correspondent does not increase his roof pipe, while in another part of the country it is necessary.

"The question is along the same lines as a universal religion. Custom has a great deal to do with these things, and is often stronger than law. Various local conditions often make necessary certain changes in the plumbing ordinance. In other words, it appears to us that while it is a pleasing thing to consider, there would be about as much chance of bringing the various elements together on one common ground as there is of bringing our two great political parties together in one common party. However, we can see where much advantage might be derived if, for instance, smaller sections of country, each state or province, for instance, could be governed by a single plumbing ordinance."

AN INTERESTING LETTER.

Montreal, March 11, 1907.

MacLean Pub. Co., Montreal & Toronto.

Sir,—I feel that a Canadian plumbing trade paper is a long felt want to the plumbers in general. I think it will be very instructive, not only to the master plumbers but also to the journeymen and apprentices, providing that it deals most especially with the plumbing trade in Canada. The great fault with the present plumbing trade journals is that they deal with mattees outside of our radius, which do not interest the plumbing craft in Montreal to any great extent. I would very gladly subscribe to such a paper, and feel confident that the plumbers of Montreal would also give you hearty support. I wish you every success in your new enterprise.

H. W. MUNDAY,
40 Bleury St., Montreal.

The well-kept want-book is found only in successful stores. The "just-out" fellow does not know its value. His customers do, however.

PLUMBER AND STEAMFITTER
OF CANADA

The MacLean Publishing Co.
Limited

JOHN BAYNE MacLEAN - - - President
W. L. EDMONDS - - - - Vice-President
H. T. HUNTER - - - Business Manager
WESTON WRIGLEY - - - Managing Editor

ASSOCIATE EDITORS.

M. J. QUINN, S.H. and V. Engineer - Toronto
C. E. OLDACRE, M.A.S.H. and V.E. - Toronto
W. HOLLEY, Associate Royal Sanitary Institute - - - - - Montreal
W. B. McKAY - - - - - Toronto
F. R. MUNRO - - - Winnipeg, Man.
G. S. B. Perry - - - Vancouver, B.C.
H. F. S. PAISLEY - - - St. John, N.B.
JAMES HICKEY - - - Halifax N.S.

Publishers of Trade Newspapers which circulate in the Provinces of British Columbia Alberta, Saskatchewan, Manitoba, Ontario, Quebec Nova Scotia, New Brunswick, P. E. Island and Newfoundland.

OFFICES:

MONTREAL - - - - - - 232 McGill Street
Telephone Main 1255
TORONTO - - - - - - 10 Front Street East
Telephones Main 2701 and 2702
WINNIPEG - - - - 511 Union Bank Building
Telephone 3726
LONDON, ENG. - - - - - 88 Fleet Street, E.C.,
J. Meredith McKim
Telephone, Central 12960

BRANCHES:

CHICAGO, ILL. - - - - - 1001 Teutonic Bldg.
J. Roland Kay
PARIS, FRANCE - Agence Havas, 8 Place de la Bourse
MANCHESTER, ENG. - - - 92 Market Street
ZURICH, SWITZERLAND - - - Louis Wolf
Orell Fussli & Co.

Subscription, Canada and United States, $1 00
Published every Wednesday

Cable Address { Adscript, London
{ Adscript, Canada

ABOUT OURSELVES.

For nearly twenty years the publishers of the "Plumber and Steamfitter of Canada" have issued "Hardware and Metal," a weekly newspaper, read not only by manufacturers, jobbers and retailers of hardware, paints, stoves, etc., but by manufacturers of plumbing and heating materials, supply men and master plumbers and steamfitters.

The plumbing and heating trades in Canada are peculiar in that in all but a couple of dozen of the larger cities, the great bulk of the plumbing and heating contracts are undertaken by hardware or stove merchants who employ plumbers to do the work for them. To aid in the dissemenation of knowledge of modern methods of sanitation and heating, therefore, a department of "Plumbing and Steamfitting" has been conducted for several years in Hardware and Metal and it can safely be said that as a direct result of the standard of work done in the smaller towns and in the rural districts has been immeasurably improved.

It has been recognized for some years that the time would come when the plumbing and steamfitting trades in Canada would require a newspaper of their own, that the inevitable tendency, particularly in the larger cities, of the trade becoming more specialized, would prepare the field for a distinctly plumbing and heating paper. About three years ago "Domestic Engineering," a well-edited paper published in Chicago, established a branch publication in Canada but the time was not yet ripe, and after a few months the publication was abandoned.

The publishers of the "Plumber and Steamfitter of Canada" feel that it is now opportune for such a publication, and with their years of experience and connection with the Canadian trade can promise that the quality of the new publication will be such as to merit the support of all Canadian business men interested in better sanitation and modern heating and lighting and in the continued development of these trades in Canada on a sound business basis.

The "Plumber and Steamfitter of Canada" will be published each Wednesday, a weekly, small though it may be at the commencement, being considered of more value to the trade than a fortnightly or monthly. The paper will aid in the organization of the plumbing and steamfitting trades along any rational and legal lines which may be proposed and it will serve as a medium through which master plumbers, steamfitters, sanitary or heating engineers, plumbing inspectors or architects may express their views on all matters pertaining to the improvement of the plumbing and heating trades.

* * *

There are many reasons why a paper should be established in Canada. Several excellent plumbing and heating trade papers are published in the United States but climatic conditions differ greatly and the steamfitter in the Montreal and Winnipeg, or in the smaller towns in New Ontario or Northwestern Canada has found that it has been necessary for him to solve problems which have not been worked out in any of the trade literature or text books of either the United States or Great Britain. The "Plumber and Steamfitter of Canada" will discuss this problem and endeavor to prepare data of value to everyone who undertakes heating contracts in this territory.

* * *

Another important work to be done in Canada is that of bringing the trade together along lines which will be satisfactory to the trade and not objectionable to the general public. It cannot be denied that association work received a black eye as a result of the court investigations in Toronto and Hamilton a year or so ago. All movements follow the line of least resistance however, and as it has been proven more satisfactory for the plumbing and heating trades to organize along association lines, reorganization will take place in Ontario sooner or later. When it does come sane counsel will undoubtedly prevail and all objectionable features be eliminated. In Toronto, during the past year, the results of disorganization have been seen in the senseless price-cutting as well as in the commencement of the sale of plumbing goods through departmental stores.

Following the disruption of the Master Plumbers' Association in Toronto a year ago an attempt was made to reorganize but conditions were not favorable and only a couple of meetings were held. This week, however, another effort is being made to get the trade together as a branch of the Employers' Association in order to take united action in dealing with the demand of the union men for an increase in wages. Wise action will be taken if it is decided to meet regularly and continue the work of organization actively.

* * *

There is no line of business in which greater advances have been made during the past few years than in the plumbing and steamfitting trades and none in which it is more necessary for the members to meet together and discuss trade problems. A few years ago a builder would call in a plumber and tell him what work he wanted him to do. Today he asks the advice of the plumber and fitter. Formerly anything at all would do in the way of sanitary appliances for factory buildings. Now there is as much skill and ingenuity displayed in the plumbing and heating work of a large building as in an architect's plans and the factory is being fitted up with conveniences such as few house of five or ten years ago could boast.

The plumber's work in preventing disease is becoming recognized to be as important as the doctor's in effecting cures and the work of the heating and ventilating engineer is easily as important as the professional work of the architect.

* * *

The plumber who secures the most profitable orders is the one who is acquainted with the most up-to-date methods and has the tools and apparatus to do the work most economically.

Few plumbers and steamfitters have the opportunity to visit the large cities where the best work is being done and he must, therefore, depend on some trade newspaper which has representatives in all the large centres capable of explaining any new ideas which have been found practicable by the best men in the trade.

Our editorial staff will include thoroughly capable men, some of whom are already well known to the trade. M. J. Quinn, formerly mechanical superintendent for the Province of Ontario and

now doing expert work in heating and ventilation for Cluff Brothers, Toronto, will be heard from occasionally. C. E. Oldacre, member of the American Society of Heating and Ventilating Engineers, well known to the trade of the Eastern States and now holding a responsible position with the Gurney Foundry Company, Toronto, will write some practical articles. Wm. Holley, an Associate of the Royal Sanitary Institue of England, now with the Robert Mitchell Company, Montreal, has written us a series of articles on "The Advancement of Practical Sanitary Science," and will be heard from on other subjects. In addition to these, W. B. McKay, Toronto; F. R. Munro, Winnipeg; G. S. B. Perry, Vancouver; H. F. S. Paisley, St. John; and James Hickey, Halifax, will assist the editor in presenting the latest developments in the trade in their respective districts.

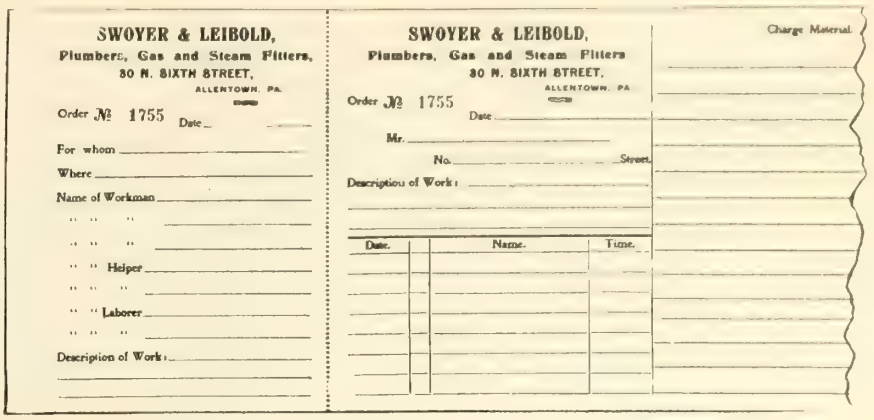
The columns of the "Plumber and Steamfitter of Canada" will also be open at all times for the discussion of trade problems and any questions asked will be answered intelligently. Already several prominent master plumbers have promised to supply short articles for the paper.

Next week's issue will contain a practical discussion of the "Advantages of Hot Water Heating over Steam Heating in a Private Residence," by several Canadian writers. Watch for it and send us your views if they do not agree with those outlined in the articles.

THE PLUMBER AS A BUSINESS MAN.

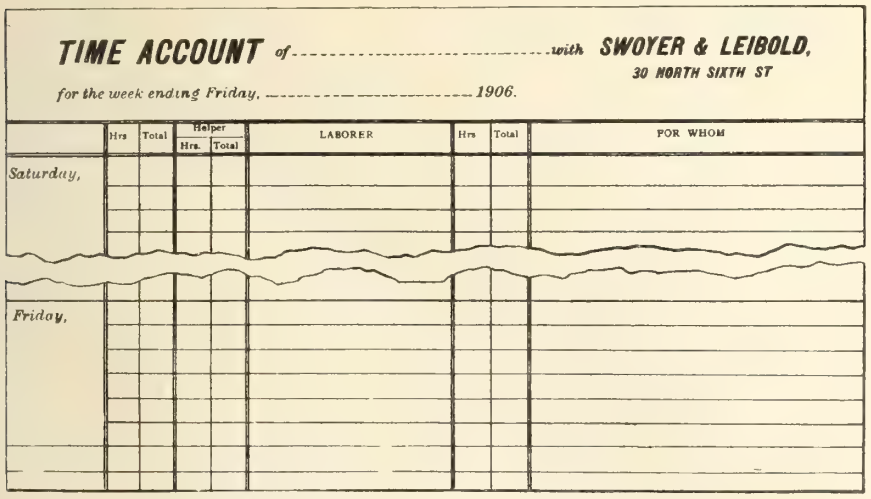
No more important work confronts the business concern than that of keeping track of the actual cost of doing work cannot be intelligently set. Keeping the cost of doing business means business or of doing any piece of work. Without being informed on both of these costs the price on any piece of keeping a record of everything for which an expenditure is made, including that which does not bring in a direct profit. Such items include insurance, taxes, water rent, horse feed, shoeing the horse, the office boy and a host of other items which will never be included in the time and materials used in putting a heating system in one building or the plumbing system in another. Whether a man keeps his own books or employs a bookkeeper, it is indispensable that a correct account be kept of all these items. Then, if in a year they amount to $1,000 or $10,000 worth of business is being done, it is evident that 10 per cent. must be added to the time and material which enter into the base cost of any job, before the true cost is found and the profit added to form the price to a customer or the bid for contract work. It is equally essential that some system be devised so that whether the workman is doing jobbing or engaged on a piece of contract work his time and the material he uses will be reported to the office. Some benefit may be derived by our readers from an explanation of part of a system used by Swoyer & Leibold, Allentown, Pa., as outlined in the Metal Worker.

One blank, it is very evident, is intended to be used in a book with the page perforated, so that a record is kept in the book. From this record the bookkeeper may demand from the workman the other portion within a reasonable time, so that a proper charge can be made. It is arranged to have the date, the name of the customer and where the work is to be done, with space for a brief description of the character of the work at the bottom and for the names of the workmen and help sent to do it. The other portion of the blank provides for the workman a duplicate of the necessary information, with space for him to keep a record of his time and for an enumeration of the materials used or the material returned. A shop which has never had such a system will find some difficulty in putting it into operation when the first effort is made, but as the effort is persisted in the proprietor will soon discover that without its use many items of expense never find their way into the charge as they should, but by their omission effect substantial inroads in the profits of the business.


SWOYER & LEIBOLD,
Plumbers, Gas and Steam Fitters,
30 N. SIXTH STREET,
ALLENTOWN, PA.
Order № 1755 Date
For whom
Where
Name of Workman
" " "
" " "
" " Helper
" " "
" " Laborer
" " "
Description of Work:

SWOYER & LEIBOLD,
Plumbers, Gas and Steam Fitters
30 N. SIXTH STREET,
ALLENTOWN, PA.
Order № 1755
Date
Mr.
No. Street.
Description of Work:
Date. Name. Time.
Charge Material.

Reproduction of Blank Used for Recording Time and Material.


TIME ACCOUNT of ..... with SWOYER & LEIBOLD,
30 NORTH SIXTH ST
for the week ending Friday, ... 1906.

	Hrs	Total	Helper Hrs.	Helper Total	LABORER	Hrs	Total	FOR WHOM
Saturday,								
Friday,								

Reproduction of Part of Blank for Recording Each Man's Time

The second blank will be found invaluable in discovering where the time paid for has been spent. Every conscientious workman is willing to lend his assistance in this work, both for the protection to himself and his employers and customers. We have reproduced this blank only for two days of the week, but the full size blank is 9½ x 12 in., and provides space for every day of the week, with spaces at the bottom for making totals.

ATTRACTIVE ANNOUNCEMENT.

The Standard Sanitary Manufacturing Co., Pittsburg, Pa., have published in the form of a neat booklet the announcement of the opening of their new showrooms in that city.

PROGRESS OF SANITATION

By Wm. Stansfield, in The Sanitary Journal of January 1950.

The advance of sanitation during the past fifty years has been more than sufficient to justify the most sanguine expectations, and the pioneers of the science, who labored during the first decade of the period, would perhaps be as much astonished as gratified could they look around to-day and realize the vast changes and improvements which have taken place within such a short space of time. From comparative statistics we learn that the average span of life has been lengthened by nearly ten years, 9.87 to be exact; that the weight of the people has been increased by about eleven pounds per individual, and the stature advanced by 1¾ inches. The chest measurement has expanded by at least two inches, while the people enjoy robust health invariably to a good old age. During the early part of the century a whole range of zymotic diseases were prevalent; these have disappeared. Consumption was regarded as a fearful scourge—now almost extinct. Cancer research was in its infancy—to-day an isolated case of cancer is a rarity.

If we turn to the newspaper files of 1906, we find that the popular mind was sorely exercised about physical deterioration and decline of the birth rate. Public meetings were held, when a number of little Daniels came to judgment gravely propounding remedies, which, when taken in the light of subsequent events, serve only to provoke a smile.

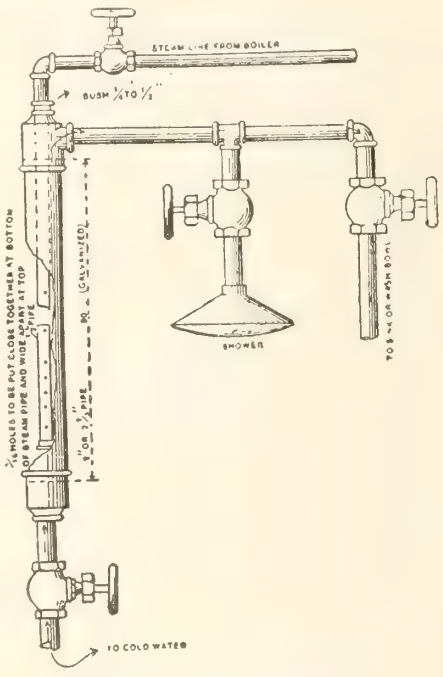
In a newspaper dated 1899, we read that "out of the 11,000 recruits who offered to enlist in Manchester for the South African war, 8,000 had to be rejected at once on account of physical defects, and of the remaining 3,000, only 1,000 could be passed into the army." This is hard to realize when we look around and reflect that to-day was could scarcely find a man unfit for the service.

And how have these changes, so vast, and so far reaching, been brought about?

So far back as 1900 it was realized that the rising generation of females, especially among the leisured classes, were improving in stature and erectness of carriage, while the men remained stationery; in three more decades the improvement was general and all round. This effect was partly due to the development brought about by the drill exercise in schools—while the vagaries incidental to this improvement need not now concern us, we merely note the result.

About 1920, the last prosecution for smoke nuisance took place, the change being brought about by the storage and transmission of electric force, while improved house construction and artificial heating have almost superseded the domestic fires, the result being that we have now very few fogs, and these not of a dangerous character.

Next came the systematic regulation of the distributive industries and the elimination of competitive waste, with the result that food adulteration disappeared, and the people were enabled to buy commodities at two-thirds of



To Warm Water for Shower Baths.

the previous prices. The last prosecution under this head occurred during the thirties.

Coincidently with these changes it had been noted that we appeared to be breeding two distinct races of children; those in water closet towns being healthy, robust and free from infantile sickness, whilst in those centres where conservancy methods were still retained the juniors showed unmistakable signs of feebleness and decrepitude.

To the present generation it might be necessary to explain the term conservancy. Some thirty years ago it was the custom in some towns to store the human excrement in pails or tubs, and sometimes in pits, called middens. The former were supposed to be emptied weekly, and the latter at less frequent intervals, and as in every case these receptacles were housed at the rear of the dwellings, the people lived in a reeking stench, unavoidably inhaling filth and infection; indeed, the wonder is that they survived at all. This condition of things was operating like the vulture at the nation's vitals, undermining and sapping the vitality of the people, and it is astonishing that while governing bodies paid attention to minor details, this overwhelming cause of sickness and debility should have remained so long in force.

Not that they could plead ignorance, for medical officers were emphatic in denunciation. The explanation seems to be, that along that period the press was in the hands of the capitalists, the capitalists were the property owners—they dreaded a change because of the expense, and hoodwinked the people with the threat of higher rates, although years before it had been ably demonstrated by a sanitary inspector, called ———— (here the name is blurred, but never mind), that water carriage was the cheaper method.

At last the state took the matter in hand and dealt with the remaining plague spots in a summary manner, and from that time forward we note a gradual, but marked, improvement in the health of the nation.

All this is now ancient history.

WARMING WATER FOR SHOWER BATHS.

There are many establishments where steam is available in which a shower bath can be used with advantage by the employes of the plant, for their refreshment in the summer season and for purely bathing purposes at the end of the day's work all the year round.

The device shown in the accompanying illustration was prepared for men working in gas manufacturing establishments.

It is made with a piece of 2-inch or 2½-inch pipe 2½ feet long. At the lower end it is reduced to ¾-inch. Where the cold water enters at the upper end there is a reducing T to ¾-inch. The side opening is where the hot water is taken off to the shower or basin. At the top of the T there is inserted a perforated tube of 1½-inch pipe with cap on the lower end. This tube is connected with the live steam line. The user can get

the desired temperature of water by adjusting the valves on the cold water and steam inlets. This will be found very handy and a cheap shower for use at the works, or any place where steam is to be had.

BANQUETTED THEIR EMPLOYES

The Bennett & Wright Company, Toronto, entertained their journeymen, employes, and office staff to a banquet last Wednesday, in honor of two of their oldest employes, Donald McRae and Harry Blackburn, who have been in the employ of the firm for 27 and 24 years respectively.

As the evening's entertainment proceeded amidst speeches and songs, Joseph Wright, the president of the company, was called upon to perform a very pleasing duty, in presenting each

ODESSA PAQUETTE
Managing Director Maison Jean Pacquette, Montreal.

of the honored guests with a luxurious leather-covered easy chair. At the same time, Mr. Wright improved the opportunity by presenting Geo. Clapperton, the vice-president of the firm, with a similar chair.

The reply of these three men was couched in language which expressed very fully their deep sense of pleasure at the honor heaped upon them.

Following a good program of songs, and recitations, the usual toasts were proposed and responded to by the following gentlemen: J. Wright, E. F. Wright, W. G. Wright, Geo. Clapperton, J. O'Leary, Geo. Kay, H. Fitzsimons, W. Miller, W. Braybon, W. J. Dickson, Geo. Hewitt, D. L. Thompson, V. Ide, G. Fitzsimons, C. Good, and C. F. Meyers, and all of whom expressed the harmonious relationship which existed between the firm and its employes.

STAR IRON CO.'S CHANGE.

The Maison Jean Paquette, hardware dealers, Montreal, have purchased for a number of years, the right to sell the output of the Star Iron Co., of Montreal, manufacturers of the "Star" boiler.

This was brought about by G. N. Ducharme, the proprietor of the Star Iron Co., wishing to devote more of his time to the manufacturing end of the business, in order to have a more complete line to meet the growing demand for this boiler, and in looking about for somebody to look after the selling end of the business, he hit on Mr. Paquette, as being one of the leading dealers in this line. The proficiency to which Mr. Paquette had brought his own business, showed that he was a competent manager, and this made Mr. Ducharme all the more anxious to close the deal with him.

Mr. Ducharme has lately invested a large amount of capital in the iron industry, and hopes that he will in the near future, be able to give Canada a manufacturing plant that will be a credit to the country at large.

The "Star" boiler is built on a design which is supposed to give the maximum of heat, with the minimum of coal consumption. The sections, instead of being flat, are oval, thereby giving the flame larger surface to cover. This is claimed to have the advantage of heating the water in a great deal less time than it could be accomplished in a flat section boiler.

PLUMBERS WANT HIGHER WAGES

The Plumbers', Steam and Gas Fitters' Union have notified their employers that they will demand an increase in wages this season. At the present time the wages are 37½ cents an hour, and the demand is for 45 cents an hour, an increase of 7½ cents. The union is giving the bosses until May 15th to consider the demand.

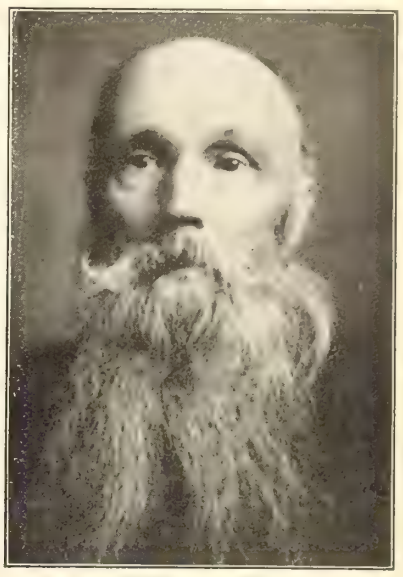
The opinion generally expressed by the master plumbers is that their employes are getting all they are worth now and that the present condition of the trade is not such as to warrant such an increase in wages. They do not feel inclined to make the concession demanded.

L. Legrow, president of the Plumbers and Steamfitters' section of the Employers' Association, would not make any definite statements. He said in regard to the demand for increase in wages, however, "It isn't the money side that's the stickler with the master plumbers. I would rather pay 60 cents an hour to a thoroughly capable man than 20 cents to an incapable man."

Mr. Fitzsimmons, of Keith & Fitzsimmons, said: "We think they (the employes) are getting all they're worth now." Asked as to whether he thought the present conditions of the trade warranted an advance in wages, he said "No."

Mr. Mansell, of Purdy & Mansell, said: "We have to pay helpers 10 cents an hour, and if we have to pay 45 cents an hour to experienced men, we shall have left no margin in the price of our work. We shall have to raise the price of the goods, which advance will bring a kick from the people of the province. Neither present conditions of the trade nor future prospects warrant an advance in wages."

Other master plumbers seen did not desire to commit themselves but the branch of the Employers' Association, which has been inactive since its organization meeting last June, has taken up the matter and it is possible that this incident may result in the trade in



G. N. DUCHARME
President of the Maison Jean Paquette, Montrea

Toronto taking a little more interest in organization work than has been manifested during the past year.

PUBLIC BATHS AT HAWAII.

The following interesting data is quoted from the report on Hawaii of the Commissioner of Labor:

"Upon all the larger plantations public baths are conducted for the use of employes. Sometimes they are partly supported by the employers, and sometimes they are entirely private enterprises, except that the bath house is usually supplied by the plantation. On some plantations hot water as well as the building is provided. Other planters supply free the fuel for heating the water. In other instances the bath house is leased to a contractor, who supplies his own fuel and charges the

employes from 26 to 35 cents a month for bathing privileges. The Japanese bathe daily. On some plantations the Koreans have adopted Japanese customs in this respect. Hot water is used and a single large tub—in which both sexes bathe together indiscriminately—suffices for the needs of a number of laborers. Private bath houses, conducted in much the same manner, are common in the Oriental quarters of Honolulu."

ABOUT THE PLUMBING TRADE

PLUMBING INVENTIONS.

J. A. Frey, Washington, D.C., has secured a patent on an automatic steam and hot water safety cock for use as an attachment to domestic water heaters and steam boilers or generators for relieving pressure of steam when it exceeds the limit of safety. It is adapted for use in the usual way for discharge of water from a heater or boiler to come into action only when the usual turning spigot is closed or adjusted to cut off discharge.

NEW PENBERTHY LINES.

The Penberthy Injector Co., Windsor, have issued their spring catalogue, which is quite an improvement over previous issues.

The company has added to its already comprehensive lines of manufactures several articles, such as Standard Steam Whistles, Plain Engine Lubricators and Penberthy Steam Lubricators. This last article is a new idea and different in construction from the ordinary steam lubricator on the market. This lubricator has a patent combination filler, gauge glass and vent arm. On ordinary lubricators the gauge glass and sight feed glass is a long tube similar to a water gauge glass. The Co.'s new lubricator is fitted with round tempered glass discs, which are out of the way, thus precluding any possibility of breakage—a decided advantage over the long tube style. The company expects to have this new article on the market this coming summer, having already applied for a patent. This is a device with a bright future, as anything new from the hands of this firm, which is patronized by all the leading dealers in Canada, is sure to be.

All firms desiring copies of the new spring catalogue will do well to write at once.

PLUMBERS STRIKE IN TORONTO

On Thursday, March 7, about forty plumbers and steamfitters in the employ of Mashinter & Co., Adelaide St. east, Toronto, went on strike, claiming that the company had been employing non-union men to instal sprinkling systems and cold storage plants in Berlin, St. Thomas and other places. Mashinter & Co. say that they have no non-union men in their employ, and have never employed any such.

PLUMBING NOTES.

Lewis Bros., plumbers and stove merchants, Belleville, are to remove to Calgary.

A patent on a new self-closing valve has been secured by N. Nilson, of New York city.

The Canadian Brass Mfg. Co., recently located at Galt, will be established by July 1st.

James Boxall, of Boxall & Matthie, Lindsay, was in Toronto on a buying trip last week.

Geo. Ecclestone, hardware merchant, Bracebridge, has now an up-to-date plumbing department added to his business.

The Dominion Radiator Co., Toronto, is suing Cartier & Cote, of Sturgeon Falls, to recover $1,098 for goods sold and delivered.

Port Arthur is to have another plumbing establishment—a branch of a Winnipeg concern. Already there are three good firms established.

The King Radiator Co., Toronto, who secured a site for their radiator works in Ashbridge Bay, Toronto, will commence building operations at once.

Moore & Brown, hardware merchants, Sault Ste. Marie, have established a plumbing department, with F. G. Sweetzer, formerly of Portsmouth, N.S., in charge.

Mr. Hutchison, of Hutchison, Sturgeon & Co., Peterboro, passed through Toronto on Monday on his way to Southampton, where he has several good jobs under way.

The Northwestern Brass Co., Winnipeg, representing an investment of $10,000, will be turning out its products in less than two months and will employ from 60 to 75 hands.

Harrison & Robertson, plumbers and steamfitters, 389 Spadina avenue, Toronto, have dissolved partnership. R. W. Harrison will continue the business at the same location.

John McCrudden, who died on Thursday in Toronto, had for 35 years been in the employ of the late John Wright, plumber. He was 53 years of age, and leaves a widow, two sons, and a daughter.

C. A. Dunham, Marshalltown, Iowa, has secured a patent on an automatic valve to close in the pressure of heat. It is useful as applied to the return ends of radiators in vacuum heating systems.

W. S. White, Denver, Col., has secured a patent on a flushing-valve. The object of the inventor is to provide a mechanism which may be regulated to increase or diminish the flushing period, as may be desired.

The Canadian Fire Extinguisher Co., Toronto, has been incorporated, with a capital of $40,000, to manufacture fire extinguishers and carry on a general plumbing business. The promoters are: F. M. C. Dickson, J. Murphy, W. Lauder, J. Lauder and F. J. Dunbar, all of Toronto.

L. A. Cornelius, president of the Wolverine Brass Works, Grand Rapids, Mich., was in Toronto recently looking around for a site for a proposed branch factory. No choice or definite arrangements were made, however. The company is handicapped in doing business in this country by the tariff.

Ed. Holer, a plumber, employed by W. H. Jones, hardware merchant, Ingersoll, is suffering from scalp wounds sustained while at work at the John Morrow screw works. He fell from a ladder, his head coming in contact with a machine. Forty stitches were necessary to close the wounds.

The Canadian Buffalo Forge Co., Montreal, have the contract for the heating and ventilation work on the new Molsons Bank building, on Bay street, Toronto. Fiddes & Hogarth, Toronto, are doing the heating work for the contractors. The ventilation is on the fan system and the heating hot water combination.

Somerville, Limited, Toronto, have decided to erect a building on their recently leased property on the Ashbridge's marsh land for the purpose of establishing brass works. The building will have a frontage of 150 feet and a depth of 400 feet, and will cost about $40,000. Commissioner of Industries Thompson has discovered that the city had no right to enter into an agreement to fill in part of the leased property without first consulting the Board of Harbor Commissioners. He thinks, however, that there will be no difficulty in entering into an agreement with the commissioners whereby the three acres of land can be filled in.

Plumbing and Heating Markets

Corrected to Wednesday, March 13, 1907.

Brass Goods.

Standard compression work, 55 per cent.
Cushion work. discount 40 per cent.
Fuller work, 65 per cent.
Flatway stop and stop and waste cocks, 60 per cent.; roundway, 55 per cent.
J.M.T. Globe, angle and check valves, 45 per cent.
Standard globe, angle and check valves 55 per cent.
Kerr standard globes, angles and checks, special, 42½ per cent.; standard, 47½ per cent.
Kerr, Jenkins' disc, copper-alloy disc and heavy standard valves, 40 per cent.
Kerr steam radiator valves, 60 p.c., and quick-opening hot water radiator valves, 60 p.c.
Kerr brass, Weber's straightaway valves, 40 per cent.; straightaway valves I.B.B.M., 60 per cent.
J.M.T. radiator valves, 50 per cent.
Standard radiator valves, 60 per cent.
Patent quick-opening valves, 65 per cent.
Jenkins' Bros., globe angle and check valves, 27½ per cent.
No. 1 compression bath cock, net $2.
No. 4 compression bath cock, net, $1.-90.
No. 7 Fuller's, compression bath cock, net, $2.25.
No. 4½ Fuller's compression bath cock, net, $2.35.
Patent compression cushion, basin cock hot and cold, per doz., $16.20.
Patent compression cushion, bath cock, No. 2208, $2.25.
Square head brass cocks, 50 per cent.
Square head iron cocks, 60 per cent.
Thompson smoke-test machine, $25.

Enamelware, etc.

Bath tubs, steel clad, copper lined, 15 per cent.
Cast iron sinks, 16x24, $1 ; 18x30, $1; 18x36, $1.30.
Closets and urinals, discount 15 per cent.
Enameled baths—List issued by the Standard Ideal Company, Jan. 3, 1907, shows an advance of 10 per cent. over previous quotations.
Lavatories—Plate E 100 to E 103, 1st quality, 20 and 5 per cent.; special, 20 and 10 per cent. Plate E 104 to E 132, 1st quality, 20 and 10 per cent.; special, 30 and 2½ per cent.
Roll Rim Sinks—Plate E 201, one piece, 1st quality, 15 and 2½ per cent.; special, 15 and 10 per cent.
Kitchen Sinks—Plate E, flat rim 300, 1st quality, 60 and 10 per cent.; special, 65 and 5 per cent.

Heating Apparatus.

Hot water boilers—Discounts vary.
Hot water radiators—47½ per cent.
Steam radiators—50 per cent.
Wall radiators and specials—45 per cent.

Range Boilers.

Galvanized iron, 30-gal., standard, $5; extra heavy, $7.75 ; 35-gal. standard, $6 ; extra heavy, $8.75 ; 40-gal., standard, $7 ; 40-gal., extra heavy, $9.75, net list. Copper range boilers—New lists quote : 30-gal., $33 ; 35-gal., $38 ; 40-gal., $43. Discounts 5 and 15 per cent.

Lead Pipe.

Lead pipe, 7c. per pound, 5 per cent.
Lead waste, 8c. per pound, 5 per cent.
Caulking lead, 6c. per pound.
Traps and bends, 40 per cent.

Iron Pipe.

Black, per 100 feet—¼-in., $2.25 ; ⅜-in., $2.25 ; ½-in., $2.72 ; ¾-in., $3.45 ; 1-in., $4.95 ; 1¼-in., $6.75 ; 1½-in., $8.10 ; 2-in. $10.80 ; 2½-in., $18 ; 3-in., $23.50 ; 3½-in. $30 ; 4-in., $34. 2 per cent., 30 days.
Galvanized, per 100 feet—¼-in., $3.08 ; ⅜-in., $3.08 ; ½-in., $3.57 ; ¾-in., $4.60 ; 1-in., $6.60 ; 1¼-in., $9 ; 1½-in., $10.80 ; 2-in., $14.40 ; 2½-in., $24 ; 3-in., $31.50 ; 3½-in., $40 ; 4-in., $45. 2 per cent., 30 days.

Iron Pipe Fittings.

Cast iron fittings, 57½ per cent.; cast iron plugs and bushings, 60 per cent.; flange unions, 60 per cent.; nipples, 70 and 10 per cent.; iron cocks, 55 and 5 per cent.; Canadian malleable, 30 per cent.; malleable unions, 55 and 5 per cent.; malleable bushings. 55 and 5 per cent.; cast iron ceiling plates, plain, 65 per cent.; cast iron floor, 70 per cent.; hook plates, 60 per cent.; expansion plates, 65 per cent.; headers, 60 per cent.; hangers, 65 per cent.; standard list.

Soil Pipe and Fittings.

Medium and extra heavy pipe and fittings, 60 per cent.; light pipe, 50 per cent.; light fittings, 50 and 10 per cent.; 7 and 8 inch pipe, 40 and 5 per cent.

Are Market Quotations Wanted?

There are few men better known in the plumbing trade in Canada than Harry Mahoney, of Mahoney Bros., of Guelph, he being Treasurer of the National Association of Master Plumbers and Steamfitters, and anything he says should go a long way with the trade. On hearing of our intention to publish the "Plumber and Steamfitter of Canada," he wrote as follows on March 11th:—

"We certainly need something to awaken the Plumbers and Heating men of Ontario to be alive to their own interests, and that might be greatly assisted by a good trade journal. I will subscribe to your paper for one year, to assist in getting started, provided you do not publish the cost price of our goods."

This raises an important question on which we would like an expression of opinion from the trade. We are in our market reports this week quoting discounts on the leading articles used by the trade. In only one or two instances—on iron pipe and range boilers—are net prices quoted. If the majority in the trade prefers, we will discontinue quoting net prices altogether.

Letters on this subject will be appreciated by the editor.

PLUMBING MARKETS.

The feature of the plumbing markets in Toronto at present is the slashing in prices on plumbers' brass goods, enamelware and closets. Trade has been quiet owing to the dull winter season and one house which is reputed to have had large stocks have been giving extra [illegible] on brass goods as well as reverting to the October price list on enamelware, giving an extra 2½ on top of that, and, in addition, cutting closets down fully ten per cent. The house in question has booked a lot of orders for delivery during the coming month. Other concerns, however, say they are not following the cut, being content to let others have all the business they can handle at the ruinous prices quoted.

The cut on brass goods is especially out of place just now, with copper making another advance. The only explanation is that old stocks are being worked off. The brass goods manufacturers say they cannot get deliveries of copper in less than eight weeks' time and their cost of production is constantly advancing. This week we report an advance on Kerr Jenkins' disc, copper alloy disc and heavy standard valves from 45 to 40 per cent.

A new list on iron pipe is looked for daily, showing about a ten per cent. advance. On sizes over 4 inches an advance has already taken place. Pipe continues scarce.

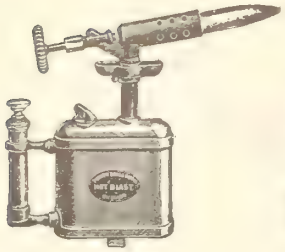
METAL MARKETS.

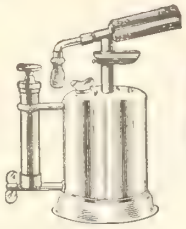
Ingot copper continues to be the feature of the market with a half-cent advance noted this week. Stocks in Toronto continue bare with supplies coming very slow. A leading New York copper interest is quoted as follows:—"The average price for copper for the entire twelve months of 1907 will probably be 25 cents a pound, and if it falls short of this figure it will be by an exceedingly small margin; and there is a possibility that an average quotation even higher will result. Indications are that the market will hold steady at the prevailing prices, but should manufacturers sell their product in excess of their copper supplies and be forced to cover their future requirements in competition with each other, a scramble would ensue (such as forced the price of copper from 20 to 25 cents a pound) in which advances to 30 cents, or even higher, would undoubtedly result. It is up to the consumers to use judgment in obtaining supplies if they would not see higher copper prices." It is said that the Calumet and Hecla Company has sold 14,000,000 pounds of their brand for July delivery at 26½ cents and the same quantity for September at 26 cents. With these conditions outside the local market cannot be anything else than strong.

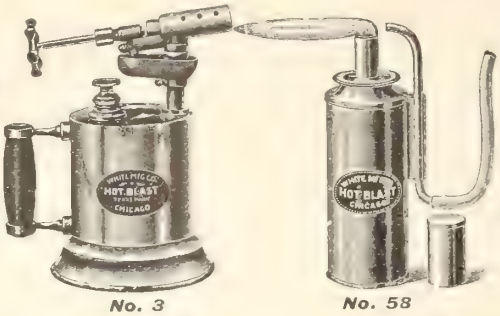
Pig iron is firmer in Great Britain and in spite of much talk the market has not yet broken in the States. A reaction across the line would not have very much effect in the Canadian market, however, for some time. Conditions in the Old Country are more interesting to Canadians and the increasing strength there indicates a steady market for some time to come. The recent weakness was caused, it is understood by the high rentals and dear money, these foreing speculators to unload some of the hundreds of thousands of tons of Middlesborough and other iron stored on warrants. With speculators wanting to sell the market was bound to weaken.

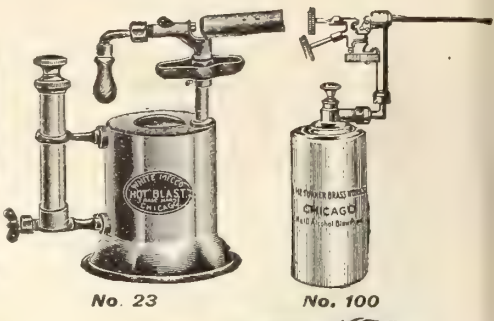
THE TURNER TORCHES AND FURNACES ARE THE HOTTEST ON EARTH

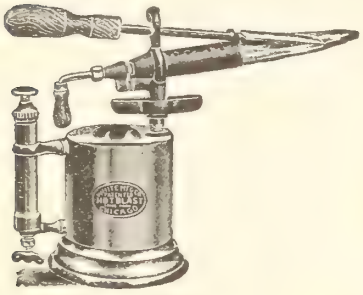
PROVE IT BY ORDERING A TRIAL SHIPMENT FROM YOUR JOBBER


No. 16

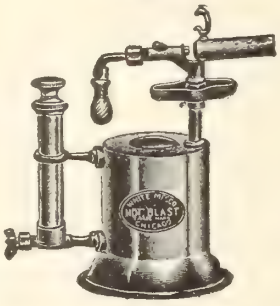

No. 12

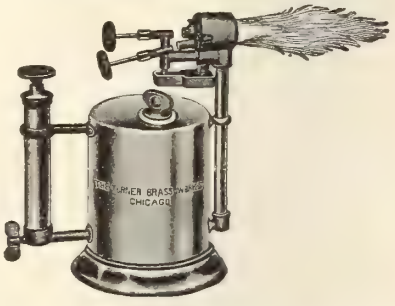

No. 3 — No. 58

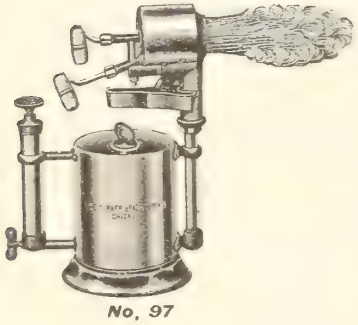

No. 23 — No. 100

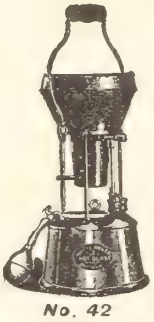

No. 21

No. 22

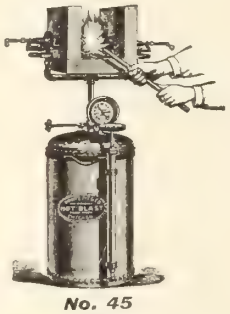

No. 54


No. 92

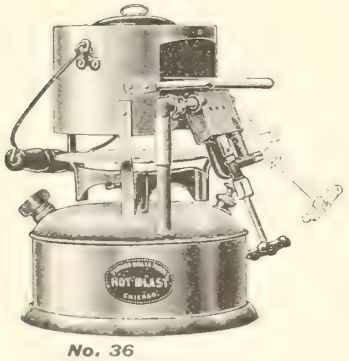

No. 97

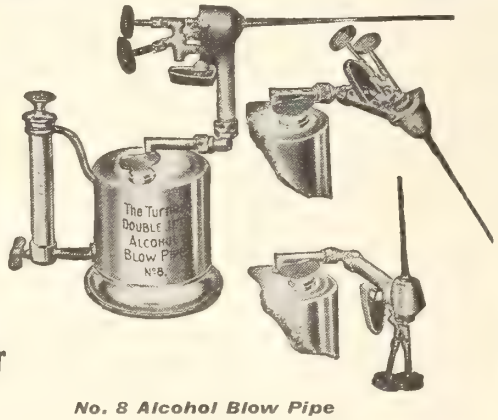

No. 42

No. 31

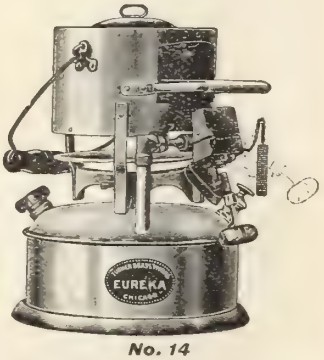

No. 45

No. 20


No. 36



No. 8 Alcohol Blow Pipe



No. 14

No. 85

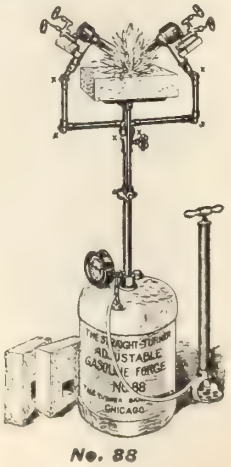
We make tools to meet the requirements of every mechanic. They are sold under our guarantee. We do lead burning on Storage Batteries with Nos. 8 and 100. Braze Cast Iron No. 88. Braze wires on Rubber Tires with No. 92, etc. JOBBERS SELL AT FACTORY PRICES. If your Jobber does not carry a stock of our tools, write us. Our catalogue is free.

THE TURNER BRASS WORKS

53 Michigan Street

CHICAGO, ILL., U. S. A.

TRADE HOT-BLAST MARK



No. 88

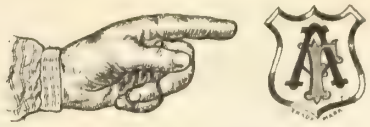
...FULL STOCK...

Salt Glazed Vitrified

Double Strength Culvert Pipe a Specialty.

THE CANADIAN SEWER PIPE CO.

HAMILTON, ONT. TORONTO, ONT
ST. JOHNS, QUE.

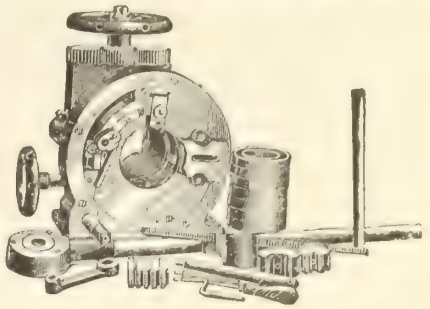


This is the Mark that Means Something

It is the distinctive brand of genuine Armstrong Stocks and Die and Pipe Fitters' Tools.
No "Armstrong pattern" or "just as good as Armstrong" have this stamp. Don't buy anything in this line that hasn't this brand as it is the mark of genuineness.

THE ARMSTRONG MANUFACTURING CO.,
292 Knowton Street, Bridgeport, Conn.

A Certain Sense of Satisfaction



Goes with every MERRELL PORTABLE HAND MACHINE, PIPE THREADING and CUTTING MACHINE. We build them that way.

For doing ALL kinds of threading—under ALL conditions—labor trouble and faulty material included—where speed, durability and ease of control count for something, our word to you is to investigate the MERRELL.

Whether it be stationary or portable—hand or power driven—30 DAYS FREE TRIAL must prove conclusively that your choice should be the MERRELL.

This Portable Hand Machine has encased gears, MERRELL standard quick opening and closing die-head, and the latest improved Cutting-off Knife.

Let us tell you more about this machine—The Chasers, Vise and the large range of work covered.

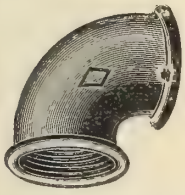
Catalogue for the asking.
Quick shipments.

THE CANADIAN FAIRBANKS CO.
Sole Agents for Canada Limited
MONTREAL, TORONTO, WINNIPEG, VANCOUVER

FACTS ARE STUBBORN THINGS

Most shrewd dealers are wise to the way I conduct my business. My customers' interests are never lost sight of for a single moment during business hours. **"Quality, Dispatch,** and then **More Quality."** That's how one man describes my goods and methods.

ORLANDO VICKERY
178-180 Victoria Street TORONTO, CANADA



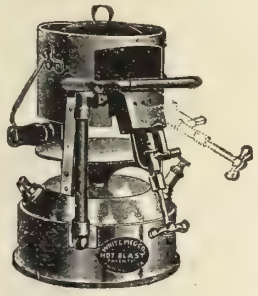
PROFIT, REPUTATION, MORE PROFIT

The wise dealer secures his trade by using and recommending

"Diamond" brand Fittings

If there were a possibility of making better fittings our experts would know about it. We would be making them.

OSHAWA STEAM & GAS FITTINGS CO., LIMITED
OSHAWA, CANADA



HOTTEST ON EARTH

Our Bonanza Furnaces are known to produce more heat with less fuel than any other make. Jobbers sell at factory prices. Satisfaction guaranteed or money refunded.

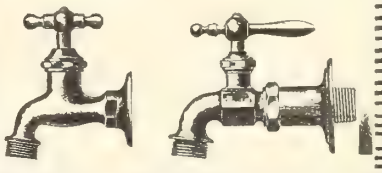
No. 38. Price, each, ***$7.80,*** net.
No. 39. One size smaller, ***$5.85,*** net.

THE TURNER BRASS WORKS
53 MICHIGAN STREET, - CHICAGO, U.S.A.

Do You Want the Best?

TWO FREE
for every one sent you defective.
Isn't that guarantee enough?

Glauber Brass Mfg. Co.
Expert Makers of Fine Brass Goods
CLEVELAND - - OHIO



The Canadian Bronze Powder Works

R. E. THORNE & CO.

The only bronze powder works under the British flag.
High Grade bronze powders and bronze liquids.
Can fill all orders at short notice.

MONTREAL — TORONTO
WORKS AT VALLEYFIELD. *NO ORDER TOO LARGE*

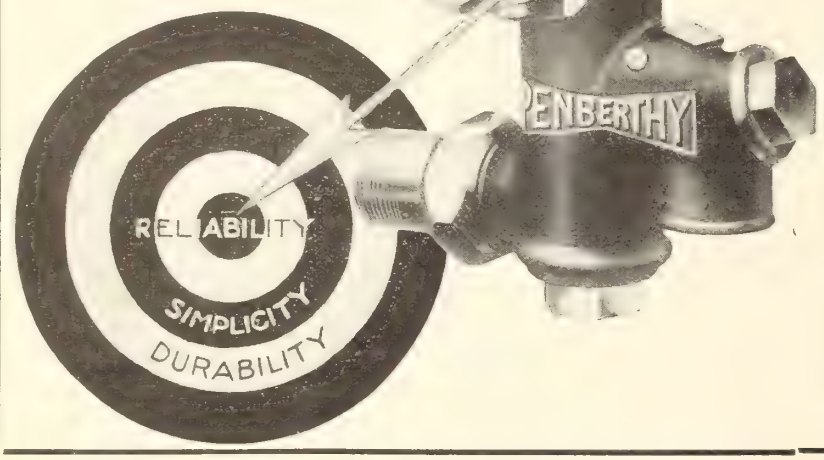
Forwell Foundry Co.

BERLIN, ONT.

Manufacturers of

SOIL PIPE, FITTINGS, and CAST IRON SINKS
Ask Jobbers for "F. F. CO." Brand

TRADE
PENBERTHY
MARK
AUTOMATIC
INJECTORS



HITS THE BULL'S EYE

The
Penberthy
Automatic
Injector

hits the bull's-eye in the approval of the world's engineers in these essential points which make the perfect Injector—

Reliability
Simplicity
Durability

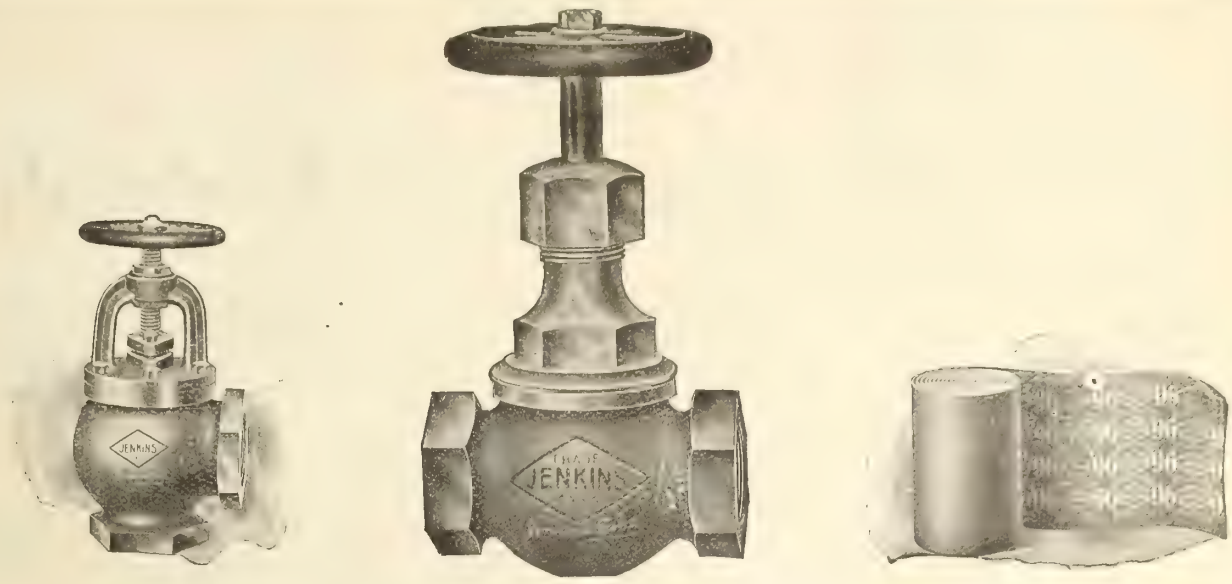
Mr Dealer, *why not* stock them?

Penberthy Injector Co., Ltd.
WINDSOR, ONT.

SPECIALISTS
IN AND
MANUFACTURERS and IMPORTERS
OF
GAS AND ELECTRIC
LIGHTING APPLIANCES

FITTINGS FIXTURES GLASSWARE	BEAVER BRAND INCANDESCENT GAS MANTLES	INCANDESCENT COAL OIL LAMPS NO PRESSURE

LIGHTING GOODS ONLY AND A SPECIALTY OF ALL KINDS
INTERNATIONAL GAS APPLIANCE CO., LIMITED
535, 537, 539 Queen St. E., TORONTO, CANADA

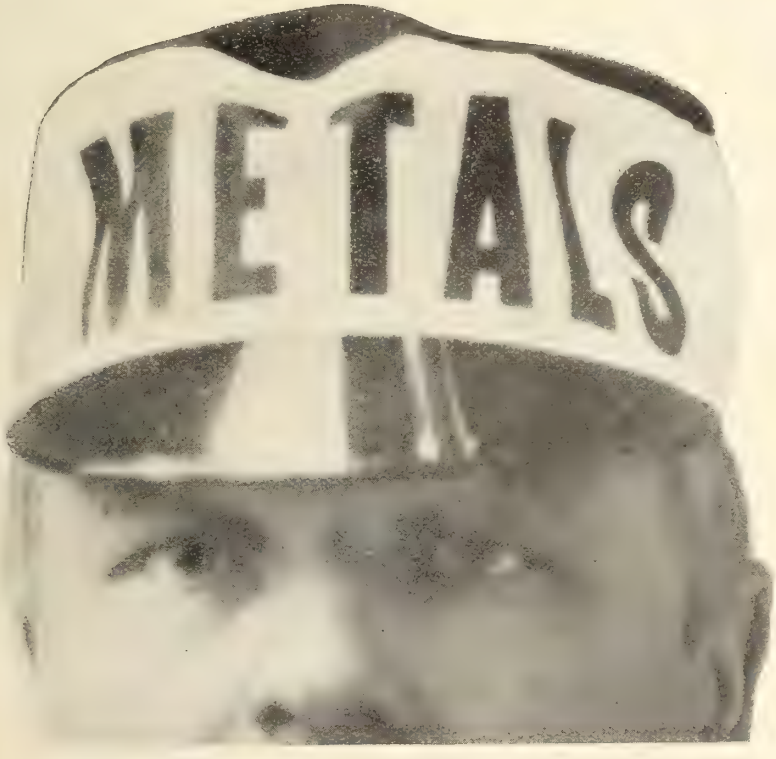


Catalogue and discount sheet sent on application.

JENKINS BROS.

35 High Street, Boston, Mass.

New York Philadelphia Chicago London, E. C.



Babbitt, Solder, Lead Pipe, Etc.

The

Canada Metal Co.

Limited

TORONTO

PLUMBERS' BOOKS

HINTS TO PLUMBERS

on

Joint Wiping, Pipe Bending and Lead Burning

By

JOHN W. HART, R.P.C.

Third Edition, Revised and Corrected. 184 Illustrations, 313 pp.

PRICE $1.50.

Contents.

Pipe Bending, Square Pipe Bendings, Half-Circular Elbows, Curved Bends on Square Pipe, Bossed Bends, Curved Plinth Bends, Rain-water Shoes on Square Pipe, Curved and Angle Bends, Square Pipe Fixings, Joint-wiping, Substitutes for Wiped Joints, Preparing Wiped Joints, Joint Fixings, Plumbing Irons, Use of "Touch" in Soldering, Underhand Joints, Blown and Copper Bit Joints, Branch Joints, Block Joints, Block Fixings, Astragal Joints, Pipe Fixings, Large Brance Joints, Large Underhand Joints, Solders, Autogenous Soldering or Lead Burning, Index.

SANITARY PLUMBING AND DRAINAGE

By

JOHN W. HART, R.P.C.

With 208 Illustrations, 250 pp.

PRICE $1.50.

Contents.

Sanitary Surverys, Drain Testing, Drain Testing with Smoke, Testing Drains with Water, Drain Plugs for Testing, Sanitary Defects, Closets, Baths and Lavatories, House Drains, Manholes, Iron Soil Pipes, Lead Soil Pipes, Ventilating Pipes, Water-closets, Flushing Cisterns, Baths, Bath Fittings, Lavatories, Lavatory Fittings, Sinks, Waste Pipes, Water Supply, Ball Valves, Town House Sanitary Arrangements, Drainage, Jointing Pipes, Accessible Drains, Iron Drains, Iron Junctions.

STEAM AND HOT WATER FITTERS' TEXT BOOK

By

THOS. E. M'NEIL.

PRICE $1.00.

Contents.

Tools, Fittings and Pipes, General Questions on Heating, Low Pressure Steam, Two-pipe Steam Heating, Single Pipe Low Pressure Steam Heating, Indirect Steam Heating, Hot Water Heating, High Pressure Steam Heating, High and Low Pressure Steam Heating and Power Plant, Exhaust Steam Heating, Power Fan or Blower System of Steam Heating and Ventilating; Design, Estimate, Specification; Dwelling House Heating, A Successful Heating Job.

PRACTICAL HOT WATER HEATING, STEAM AND GAS FITTING, ACETYLENE GAS, HOW GENERATED, HOW USED

PRICE $1.50.

Illustrated.

Showing the latest and most approved Devices used, the value of Acetylene Gas as an Illuminant Discussed from Various Points of View; Every Class of Generator Described; Gas Burners and Piping; also the Best and Quickest Methods of doing Hot Water Heating, Steam and Gas Fitting, up to the Present Date.

By

JAMES J. LAWLER

and

GEORGE S. HANCHETT, S.B., M.A.I.E.E.

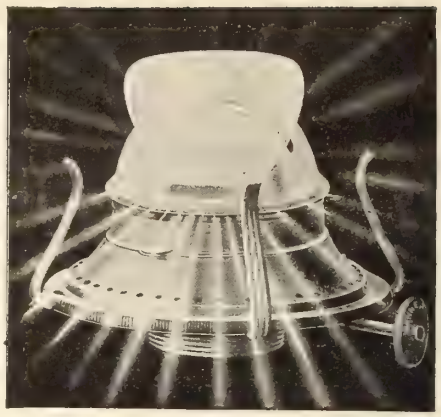
Addenda.

Complete Steam One-pipe Circuit System, A (insert); New Special Hot-water Distributing Fitting; Soft Coal Steam and Hot-water Heater, A.

MacLean Publishing Co.

LIMITED

MONTREAL TORONTO WINNIPEG



It's the

GLASS CONE

that makes this new burner a great success.

It gives full benefit of flame down to the very wick top.

FOR SALE BY ALL PROMINENT DEALERS.

MANUFACTURED BY

The Ontario Lantern & Lamp Co.

LIMITED

HAMILTON, ONT.

No. 7 Hand Drill

Cut gearing, change of speed for light or heavy work. Ball bearings, Rack and pinion feed, either hand or automatic. Treadle feed to lower the spindle to the work. A weighted lever raises the spindle instantly as soon as the feed is disengaged. Incomparably the best hand drill in the market, and also a first-class wood boring machine. Fitted for power if desired without extra charge. Weight 375 lbs. Send for circular.

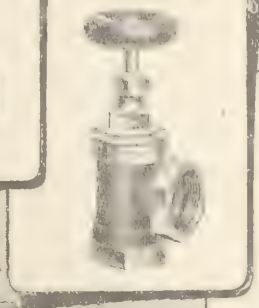
It pays to use the best tools.

A. B. JARDINE & CO.

HESPELER - - - ONTARIO

KERR'S GLOBE AND GATE VALVES

STRICTLY HIGH GRADE. TESTED & PACKED



THE KERR ENGINE CO. LIMITED

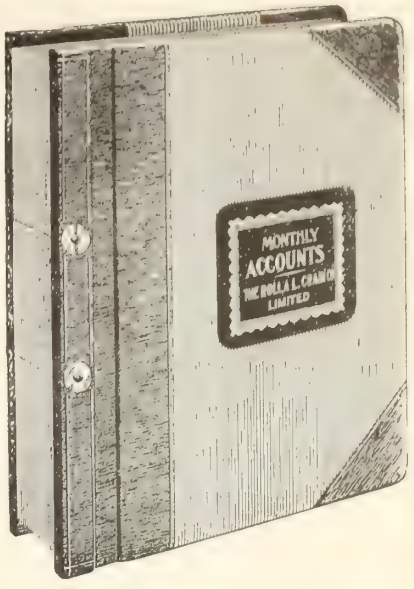
VALVE AND HYDRANT MANUFACTURERS

WALKERVILLE, ONT.

Convenience
Accuracy
Economy

Are three strong arguments in favor of Loose Leaf Systems of Book-keeping which should enlist you among the thousands of users of

THE CRAIN CONTINUOUS SYSTEMS



Did you ever lose time and patience hunting through a card index drawer for an important record that has been taken out and put back in the wrong place?

In The Crain Continuous Systems every record is in its proper place, entries can be made without removing sheets in half the time. It is absolutely safe, and from an economical standpoint, it is without a rival.

The Crain Monthly Account System for the retail trade will pay for itself in a very short time.

Write for catalogue E which will give you full information

THE ROLLA L. CRAIN CO., Limited

OTTAWA, CANADA

TORONTO, 18 Toronto St., MONTREAL, Alliance Bldg., WINNIPEG, Nanton Block.

NORTON GRINDING WHEELS

MADE OF ALUNDUM

are better than others because of their fast cutting qualities and uniformity.

ALUNDUM

s the hardest, sharpest and most durable abrasive known. **ALUNDUM WHEELS** are furnished in any size or shape and in the various grades of hardness.

If you are finishing your work in a lathe we can save you money, and get better results with **ALUNDUM WHEELS.**

CANADIAN FAIRBANKS CO., Limited

MACHINERY AND SUPPLIES

MONTREAL TORONTO WINNIPEG VANCOUVER

We make Electric Fixtures, Sockets, and Cut-Outs

Munderloh & Co

Electrical Supplies of all kinds. MONTREAL.

"Standard" Plate P-504

"Standard" Porcelain Enamel "LENOX" Design Lavatory, with Slab, Bowl and Apron all in one piece, Nickel-plated "Hexagon" Pattern Legs with Wall supports, Nickel-plated "Torrance" Pattern Fuller Faucets with china handles and Indexes, Supply Pipes with Globe Air Chambers, and Compression Stops with china Indexes, Imperial Waste with china Index and Unique Trap with Waste and Vent to wall.

"Standard" FIXTURES

REALIZE YOUR CLIENT'S IDEAL

OUR "Ideal Bathrooms" have taught Property Owners in every part of the country to accept "Standard" Fixtures as the ideal equipment for Kitchen, Laundry, Bathroom and Bedroom.

Specify "Standard" therefore, and you realize the client's ideal. The satisfaction given by the permanance and durability of "Standard" Porcelain Enameled Ware no more than equals the pleasure given by its snowy white purity and beauty of appearance.

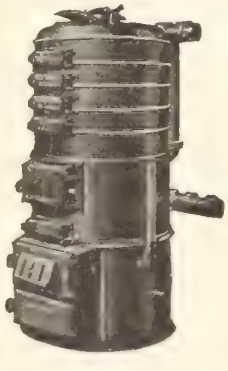
Standard Sanitary Mfg. Co.

PITTSBURGH, PA.

This is the Wise Dealer's busy season. Not that he's doing an immense amount of trade, but he's preparing for it. He has done more judicious talking this last few weeks than he has done for months past, and he has talked lots about

THE

"Sovereign" Boiler



Because there's money in that Boiler for him. There's no doubt about it. Besides, the man who instals one **"Sovereign"** simply takes out a policy assuring success in the Hardware business. Let us mail you particulars. Our **"Profit Story"** makes interesting reading.

TAYLOR-FORBES COMPANY, Limited

Head Office and Works: GUELPH, ONT.

TORONTO—1088 King St. West.

MONTREAL—122 Craig St. West.

PLUMBER & STEAMFITTER OF CANADA

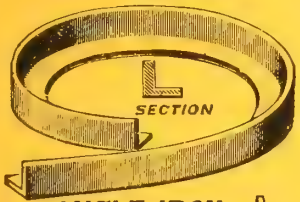
SUBSCRIPTION : ONE DOLLAR PER YEAR. PUBLICATION OFFICE : 10 FRONT STREET EAST, TORONTO

Vol. I. No. 2. (New Series). MONTREAL, TORONTO, WINNIPEG, APRIL 17, 1907. Old Series, Vol. XIX. No. 12

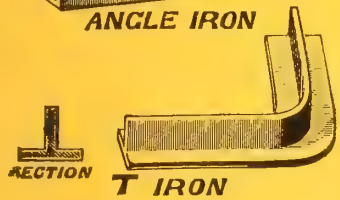
A TIME SAVER !

Kennedy's Patent Bending Machine

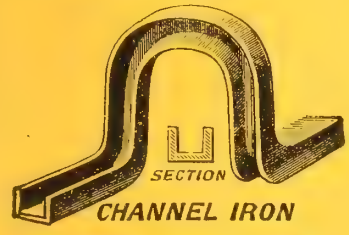
HALF ROUND



ANGLE IRON



T IRON



CHANNEL IRON

FLAT BENT EDGEWAY

SOLID SECTIONS BENT COLD

USED BY GENERAL ENGINEERS, ELECTRICAL ENGINEERS, GAS FITTERS, PLUMBERS, Etc.

For bending welded, butt-jointed and seamless tubing; also round, flat, angle, tee and channel bars, in copper, brass, iron or other metals.

This machine, like the tube vice, stocks and dies, etc., will undoubtedly become one of the pipe fitter's regular tools, included in his kit, and taken out with him on every job.

Any number of bends can be made at any angle and in any position on long lengths of work

doing away to a large extent with stock elbows, bends and sockets, also saving a large amount of cutting and screwing, thus reducing the possibility of leaky joints. Tubing within the dimensions stated below are bent ***cold,*** without annealing or loading in any way.

ADVANTAGES

Makes a smooth, continuous, neat and more finished job.
Saves cutting and screwing.
Saves stock bends, elbows and sockets, causing ugly and possibly leaky joints.
Tubes bent cold without bulging, and yet without loading or annealing.
Any number of bends made on a single piece of work.
Repeats bends exactly.
Compact, yet portable and strong; can be fixed to any bench.

Specimens on exhibition at
THOS. ROBERTSON & CO., LIMITED, 734 Craig St. W., MONTREAL

Prices and particulars may be obtained of
THOS. ROBERTSON & CO., LIMITED, MONTREAL
JAS. ROBERTSON & CO., LIMITED, King St., TORONTO
J. A. BERNARD, 21 St. Peter St., QUEBEC

For agencies in other districts write

WM. O. GREENWAY, 13 St. John Street, MONTREAL

The Merit of Standard Ideal Porcelain Enameled Ware

Porcelain Enameled Lavatory Cast in One Piece

is recognized by the Plumbing and Hardware trade. Standard Ideal Ware is of one-piece construction, durable in character and of designs calculated to meet the requirements of the Canadian markets.

Standard Ideal Lines

We manufacture Bath Tubs, Sitz Baths, Shower Baths, Lavatories, Urinal Ranges, Slop Hoppers, Laundry Tubs, Sinks, Closet Ranges, Steamship Supplies, Railway Car Supplies, Hospital Appliances

Porcelain Enameled Sectional Lavatories

The Standard Ideal Company LIMITED

Head Offices and Factories: PORT HOPE, ONT.

SALES OFFICES AND SAMPLE ROOMS:

TORONTO
50 Colborne Street

MONTREAL
128 West Craig Street

WINNIPEG
24 Telfer Block

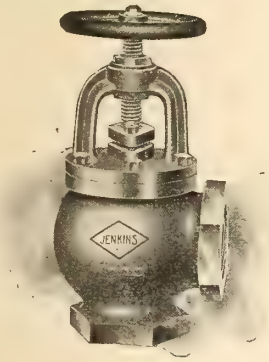
Plumbers' and Steamfitters' Supplies

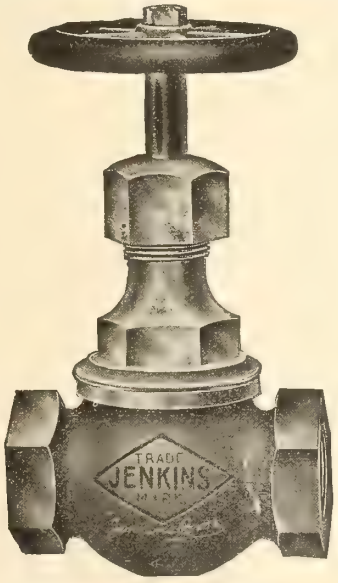
Quotations
Cheerfully
Furnished

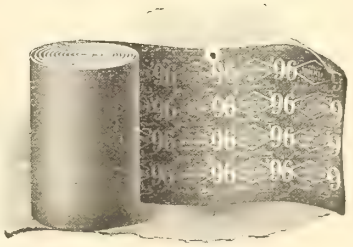
A Full Line
always
on hand

SOMERVILLE LIMITED

59 RICHMOND STREET EAST - TORONTO





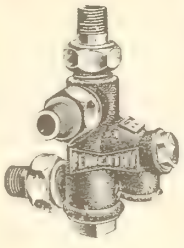


Catalogue and discount sheet sent on application.

JENKINS BROS.

35 High Street, Boston, Mass.

New York Philadelphia Chicago London, E. C.



That Spring Delivery

should include some Penberthy Automatic Injectors and an assortment of the following:

EJECTORS
WATER GAUGES
GAUGE COCKS
AIR COCKS
LUBRICATORS
WHISTLES
RADIATOR VENTS
OIL CUPS
GREASE CUPS, Etc.

"Silex"
Self-Feeding Grease Cups

"Saturn"
Plain Compression Grease Cup

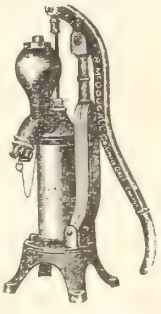
"Salute"
Sight Feed Oiler

Write us for our New Catalogue

PENBERTHY INJECTOR CO., Limited, WINDSOR, ONT.

THE SUMMER COTTAGES

will soon need something to supersede the old-fashioned way of drawing water.



OUR GILT EDGE PUMPS

are built for the purpose and a few words will convince you that they would be a good thing to have in stock. The real article will sell itself. We have others, of course, and all through it is quality first.

McDOUGALL PUMPS ARE STANDARD

THE

R. McDougall Co., Ltd.

GALT, CANADA

"CANADIAN"

SPIRAL PACKING

(Highest Quality)

"Made in Canada"

We've manufactured 90 per cent. of all Spiral Packing sold in Canada during the past twenty years.

Our Packing is Different—and Better

THE

CANADIAN RUBBER CO.

OF MONTREAL LIMITED

Mark of Quality

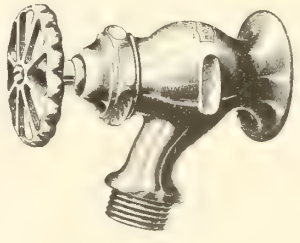
155 Granville Street, - Halifax, N.S.
Imperial Bank Bldg., St James Street } Montreal, Que.
Front & Yonge Sts., - Toronto, Ont.
89 Princess St., - Winnipeg, Man.
403 Cordova St., - Vancouver, B.C.
Dewdney St., - - Regina, Sask.
First St. W., - - - Calgary, Alta.
Wharf St., - - - Victoria, B.C.

Babbitt, Solder, Lead Pipe, Etc.

The
Canada Metal Co.
Limited
TORONTO

Mueller Compression Sill Cocks

Body threads engage all the stem threads during compression. Stem will not chatter or work loose on account of premature wear of top threads. Tee or wheel handle or loose key, straight or bent nose.



THE MARK OF UNCONDITIONAL DECATUR H⬡M ILL. U.S.A. REGISTERED TRADE MARK MUELLER GOODS GUARANTEE

H. MUELLER MFG. CO.
Decatur, Ill., U.S.A. New York, N.Y., U.S.A.

Advantages of Hot Water Over Steam

Interesting Discussion by Several Correspondents—Various Arguments Presented Favoring Hot Water as Best System for Residences—Further Discussion Invited.

Several weeks ago Hardware and Metal asked for replies to the question: "What advantages does hot water have over steam in heating a private residence?" Many heating contractors in all parts of the Dominion forwarded replies, some of the writers expressing their views frankly, but stating that their letters were not for publication.

A prize was offered for the best letter, and it is unfortunate that the winner, "G. S.," of London, has asked that his initials only be used if the reply is published. There is little reason for backwardness on the part of Canadian plumbers. Now that they have a paper of their own, which circulates exclusively amongst men engaged in the plumbing and steamfitting trades, it is to be hoped that there will not be many who will be "backward in coming forward" to express their views on subjects of interest to the trade. Only by a free expression of views and a full discussion of trade problems can the standard of work be improved—and every true plumber and fitter prides himself on the scientific and humanitarian work which he is engaged in.

Discussion Necessary to Progress.

It is gratifying to realize that there is an increasing number of Canadian plumbers and fitters who are capable and willing to discuss trade problems at conventions and in trade papers. Were it not for the marked development in this direction it is doubtful if The Plumber and Steamfitter would now be in existence, as a plumbing trade newspaper must be kept interesting by the contributions of the practical men who are superintending the work done and overcoming the problems which arise in the installation of the sanitary and heating apparatus in the buildings throughout Canada.

Of the five letters published in answer to the question referred to, one was written by a traveler for a manufacturing concern, and M. J. Quinn, who acted as judge in awarding the prize for the best, gave the traveler's letter first place in the contest. It was decided, however, that it would be more just to the other writers to exclude the traveler's contribution, and the prize was, therefore, awarded to "G. S." In future contests two prizes will be offered, one for the representatives of the supply houses and the other for the men engaged in the practical work.

All of the letters published contain considerable merit and give good reasons why hot water should be used in preference to steam. Chief among them is the fact that the former system is more easily controlled, and for that reason, while producing a comfortable temperature during any kind of weather, is much more economically operated. Not only is economical operation possible during mild weather, when the fire may be kept very low, but it is also possible during severe weather, when, by reason of the great difference existing between the temperature of the fire and that of the water contained in the boiler, a very much greater proportion of heat units is absorbed by the latter body than there would be in the case of steam, where the difference between the hot gases and the contained water is not so great.

The letter written by "G. S." is a series of practical arguments such as an intelligent steamfitter would use when endeavoring to convince a customer to install a hot water heating system in a residence, a system which will give the contractor a satisfied customer. The prize-winning letter is as follows:

The Prize Winning Letter.

Hot water heating for private residences is the best mode of heating of the present day. In a hot water system, the moment you heat the water to any degree it circulates, and it is not necessary to have the water heated to more than 165 degrees. Thus, it will be noticed, you cannot heat the air more than that. Therefore you do not dry out, or burn the air, as it were. This is why hot water heating is so healthy.

With steam heating you have to keep the water boiling to 212 degrees Fahr. before you have a circulation. While there have been many ingenious devices designed or invented for the purpose of regulating or diminishing the temperature of heat given off by a steam heating apparatus in moderate weather, they have all proved failures, especially when in the hands of the ordinary inexperienced help who have charge of nine-tenths of the heating apparatus placed in private residences. The variation of temperature which can be obtained in a steam heating apparatus, from atmospheric to five pounds pressure, is 15½ degrees, while a hot water heating system can be run from 100 to 200 degrees Fahr., or a variation of 100 degrees, so that a steam plant designed of ample capacity to thoroughly heat a building in zero weather will overheat it in moderate weather, without the possibility of being able to regulate it except by completely closing off the radiator or coil, making an uneven temperature.

A hot water heating plant of ample capacity to heat a residence to say 70 degrees in zero weather can, by simply reducing the fire and regulating the dampers, be arranged to maintain a uniform temperature of 70 degrees when the thermometer outside registers 10, 20 or 30 degrees above zero. This can be obtained by ordinary help.

The fact that you can, by reducing the fire in a hot water heater, reduce the temperature evenly throughout the apparatus, coupled with the fact that two-thirds of the weather during ordinary winters is moderate, when you require only a moderate degree of heat, is the real secret of the positive economy of fuel, which can always be found in a properly installed hot water heating apparatus over steam.

The only advantage steam heating has over hot water is ease of application and radiators on a steam plant taking up less room, being less surface for steam than water. The first cost would be less for a steam plant than for a hot water plant, but the after cost for repairs caused from strains of expansion and pounding of air in pipes and collections of rust and lime would all go to shorten the life of a steam heating apparatus.

G. S.

London, Feb. 27, 1907.

Argues in Favor of Steam.

Arthur Desmarchais, foreman of the plumbing department for Carter Bros., Picton, outlines the following comparative advantages of hot water and steam heating:

1. The first cost of a hot water system is the most expensive, probably from 20 to 25 per cent. more than a steam heating system. This is due to the larger size of pipes and radiators used in a hot water system.

2. Hot water gives a very mild and even heat. In steady cold weather or in mild weather hot water answers all purposes for residences, and you can keep a room any temperature you wish. Hot water takes more time to circulate than steam, it is more even, and maintains a uniform temperature longer than steam.

3. A hot water system requires very little attention on the part of the attendant. Most of the hot water jobs are equipped with an automatic feed tank. By being so constructed the system is always full of water, therefore avoiding all danger except in a case of freezing. As for fuel, a hot water job is the cheapest, especially in residences, because in mild weather you can run it so much lower and longer with the same amount of coal than a steam boiler.

When the temperature of the water

in the boiler reaches from 80 to 125 degrees you can heat a house in mild weather with hot water, but a steam system must always be brought to 212 degrees before any heat whatever is felt.

These are the reasons why hot water has the advantage over steam in some cases.

4. A steam system requires more attention and skill on the part of the attendant than a hot water system.

As regards freezing, the preference is with steam. One reason is, if a person desires to close his house for a week or so in cold weather, and has a warm cellar or basement, there is no danger of it freezing. With hot water he would have to empty the whole system to keep it from freezing in such a case.

5. Another advantage steam has over a hot water system—in case a radiator or pipe should burst there is no danger of any damage being done by steam, but with hot water if a pipe or radiator should happen to burst, by a freeze up or other reasons, it is liable to do considerable damage before the system could be emptied.

6. Steam has another advantage over hot water—the heat can be increased or dismissed in less time than hot water, being more promptly responsive to any sudden requirements. Steam turns, or circulates, the air in a room more quickly than hot water, and therefore is best adapted for any building where a considerable amount of fresh air is admitted by the frequent opening of doors or with a ventilating arrangement.

Because of the fact that it is possible to get heat more quickly, or cool off more quickly, steam is particularly adapted for schools, churches or public buildings.

ARTHUR DESMARCHAIS.

Picton, Ont., Feb. 25.

Hot Water Most Economical.

Hot water heating for dwellings possesses many advantages over steam heating. It is the best adapted method for this purpose and the most economical system in use. The necessary apparatus is very simple and easily understood and managed. Under ordinary circumstances good results should always be obtained with this system. The genial, mild, balmy character of the air warmed by water is accomplished by the contact of the air with the surfaces of radiators which are heated to a low degree of temperature by the water flowing through them. Water can be sent through the pipes at any temperature below 205 degrees with proper attention to dampers, resulting in an equal distribution of warmth and no danger of overheating in mild weather. In this respect water is superior to any other system. Steam, on the other hand, requires 212 degrees of heat to secure any circulation.

Water heating is the acme of safety. With ordinary care explosions cannot occur, the only pressure on the fittings being the weight of the water used. At the air cock there is no danger of scalding or damage to curtains and furniture as with escaping steam. In short, the advantages of hot water over steam are found in the uniformity with which the heat is distributed, the pleasant effect of the atmosphere heated, its cleanliness, fuel economy, simplicity, safety and ease of management. Another feature of water heating is that a boiler can be fitted into an already existing hot air furnace if it is desired to discontinue the hot air.

Steam heating is more up-to-date and has a distinct advantage over hot water in the first cost of material and fitting. Smaller radiators can be used and the cost of return pipe saved. One flow pipe does for steam, whereas several may have to be used for hot water. Steam acts quicker and also cools quicker, and there is no danger of bursting pipes through frost when not in use.

D. G. ROSS.

Winnipeg, March 12.

Merits of Systems Compared.

It will generally be found that the first expense of steam heating is considerably less.

The tests which have been made have generally shown somewhat higher efficiency for hot water.

The discharged gases may be somewhat lower for the hot water heater than for the steam boiler, and in comparatively mild weather the fire for the hot water heater may be regulated closer to meet the demand for heat.

The hot water system in general requires rather better workmanship in the erection of pipe lines than steam heating, and more care must be taken in proportioning the various pipes and fittings.

The heat from hot water radiators is somewhat less in intensity and more pleasant than that from steam radiators.

ERNEST E. READ.

Hagersville, Feb. 28.

Further Discussion Invited.

Some interesting points for controversy undoubtedly appear in the above letters, and we have purposely refrained from commenting on some of the points made. We invite short letters from readers of The Plumber and Steamfitter who take different views from those expressed by the writers of the communications published.

For instance, do readers of the paper agree to the conclusions arrived at by "G. S." in his last paragraph where he refers to the pounding of air in pipes? And Mr. Desmarchais contends that a hot water job can be operated cheaper than a steam boiler and that there is less danger of damage from an explosion of steam than a hot water pipe or radiator. Some may take exception to these points. If so, let us have a further discussion.

The next issue of the paper will contain the interesting letter written by the traveler in answer to the question under discussion.

QUESTIONS AND ANSWERS

Readers of The Plumber and Steamfitter are requested to send us short questions which have puzzled them while engaged on any jobs undertaken recently. Probably no class of workmen run across such interesting problems as do plumbers and steamfitters, and certainly no department of a plumbing trade newspaper is more interesting than the "Questions and Answers" pages.

M. J. Quinn, who will have charge of this department, has had a wide experience, having been for many years mechanical superintendent for the Ontario Government, having charge of all heating and plumbing work in the asylums and public buildings of the province, as well as giving expert assistance to the Board of Health in improving the sanitary conditions of the towns and health resorts in the Muskoka and Kawartha Lakes Districts. He is now doing heating and ventilating engineering work for Cluff Bros., Toronto.

Send along the questions or explain the problems which have puzzled you in your work, accompanying the letter with rough sketches wherever possible. The questions will be answered in as plain and intelligent a manner as possible and other readers will undoubtedly benefit as much as the one who sends in the query.

JAMES ROBERTSON CO. EXPANDING.

The James Robertson Co., Montreal, who for some months past had been making extensive alterations and improvements to accommodate the remarkable increase in their brass foundry and finishing shops, and had just moved into their new quarters when the recent fire occurred, burning part of the foundry and some patterns, have reconstructed their foundry and replaced the patterns. The increase in sales of babbit metals, type metals of all kinds and solders has been such as to force the firm to erect several more furnaces. The alterations in the hydraulic press room have made space for the fourth hydraulic press. This press, which is now being installed, is said to be the most modern wire solder manufacturing machine made, costing in the neighborhood of $5,000 and having a capacity of four tons daily.

PLUMBER AND STEAMFITTER
OF CANADA

The MacLean Publishing Co.
Limited

JOHN BAYNE MacLEAN - - - President
W. L. EDMONDS - - - - Vice-President
H. T. HUNTER - - - Business Manager
WESTON WRIGLEY - - - Managing Editor

ASSOCIATE EDITORS

M. J. QUINN, S.H. and V. Engineer - Toronto
C. E. OLDACRE, M.A.S.H. and V.E. - Toronto
W. HOLLEY, Associate Royal Sanitary Institute - - - - - Montreal
W. B. MACKAY - - - - - Toronto
F. R. MUNRO - - - Winnipeg, Man.
G. S. B. Perry - - - Vancouver, B.C.
W. E. HOPPER - - - St. John, N.B.
JAMES HICKEY - - - Halifax N.S.

Publishers of Trade Newspapers which circulate in the Provinces of British Columbia Alberta, Saskatchewan, Manitoba Ontario, Quebec Nova Scotia New Brunswick, P. E. Island and Newfoundland

OFFICES

MONTREAL - - - - - - 232 McGill Street
Telephone Main 1525
TORONTO - - - - - - 10 Front Street East
Telephones Main 2701 and 2702
WINNIPEG - - - 511 Union Bank Building
Telephone 3726
LONDON, ENG. - - - - - 88 Fleet Street, E.C.
J. Meredith McKim
Telephone, Central 12960

BRANCHES:

CHICAGO, ILL. - - - - - 1001 Teutonic Bldg.
J. Roland Kay
PARIS, FRANCE - Agence Havas, 8 Place de la Bourse
MANCHESTER, ENG. - - - 92 Market Street
ZURICH, SWITZERLAND - - - - Louis Wolf
Orell Fussli & Co.

Subscription, Canada and United States, $1 00
Published every Wednesday

Cable Address { Adscript, London
Adscript, Canada

ABOUT OURSELVES.

This issue of The Plumber and Steamfitter will be read by many who did not secure a copy of the first issue, and a brief outline of the aims of the publishers is, therefore, necessary. Circumstances have made necessary a considerable delay in printing this number, but postal registration has now been secured and future issues can be looked for regularly twice each month, it having been decided to publish semi-monthly for the first year at least.

The new paper is an outgrowth of the Plumbing and Steamfitting Department of Hardware and Metal, which, for nearly twenty years, has been the only means whereby Canadian plumbers could keep posted regarding their trade and market happenings, as well as read technical articles written in plain, understandable terms. The department, valuable though it was, did not give the best of satisfaction to either publishers or subscribers, as if several pages of space were given to plumbing subjects letters would be received from hardwaremen who do not engage in plumbing, objecting to too much attention being given that department. The publishers were, therefore, not able to give sufficient attention to plumbing, heating and ventilating, and for a long time the subject of commencing the publication of a new paper has been under consideration.

Arrangements have been completed for several interesting series of articles which are certain to be of considerable educational value to both master plumber and journeyman. Mr. Holley, of the Robert Mitchell Company, Montreal, will follow his article in the present number on the "Advancement of Practical Sanitary Science" with about a dozen others which will be of even greater interest. Mr. Oldacre, now with the Gurney Foundry Co., Toronto, but for many years engaged in heating work in Philadelphia, Chicago and other parts of the United States, will contribute regularly. M. J. Quinn, already well known to the trade in all parts of Canada, will conduct a department of "Questions and Answers," and W. B. Mackay, another of the Toronto staff, will contribute a series of articles on "Steam Heating in Practice," the first example being a hardware store, in our next issue.

The lighter side will also be catered to by the publication of articles on "Where Plumbing and Heating Supplies are Made," "Prominent Men in the Trade," etc. It will be readily conceded also that our facilities for gathering the news of that trade are unequalled, staff correspondents being located in most of the leading centres of population where important work is being done.

As a forum for the exchange of views, as a medium for the dissemination of news, as an educational periodical for both employer and employe, and as an advertising medium for manufacturers and supply men, there is undoubtedly a splendid field for The Plumber and Steamfitter, and the publishers solicit the co-operation of the trade in making the paper of as much value as possible to the Canadian plumbers and steamfitters.

TRADE ORGANIZATION.

No better example of the necessity and value of trade association can be found than the experience of the plumbing and steamfitting trades in Toronto during the past two or three years.

Abuses, undoubtedly, existed in the old Master Plumbers' Association, but the great bulk of the members were in the organization with no other desire than to increase their knowledge and secure a reasonable margin of profit on the work they do. The evils participated in by the few brought destruction upon the association, however, bad legal advice helping in the work of disorganization.

For over a year there has been no organization, and in the face of stiff advances in the cost of material, as well as demands for higher wages by journeymen, contract prices have been cut until profit has been eliminated almost entirely. Some failures have resulted, and others, seeing the way things were going, have gone out of business voluntarily. Wray & Morgan, for example, employed a dozen men two years ago. Last year they cut this down to four or six, and this year they have sold their stock, put a "For Sale" sign on their building, and have decided to take a holiday during the summer, beginning work again next fall on jobbing work, with their homes as their place of business. Other examples could be quoted of firms going out of business, of plumbers engaging in building in order to make a living, etc., but the above instance is sufficient. After several years of success in business the firm could not realize a cent on its goodwill, and could not sell the business as a going concern.

The year of disorganization has developed other evils than price-cutting. Departmental stores now carry stocks of fixtures and supplies, and it is harder for the trade to get its margin of profit, while the sale of fixtures by concerns which do not instal them tends to encourage a poorer class of work being done. Complaints of supplies being sold direct to builders are also heard on every hand. Speculators who are building for profit are not interested in doing first-class work. They will scamp the jobs wherever possible and much of the discredit will be placed where it does not belong—on the plumbing trade.

During the past month or so conditions have developed which make possible a reorganization of the trade in Toronto. The journeymen are asking a jump in wages from 37½c. to 45c. per hour and the bosses have been forced to get together to discuss the demands of the men, over eightly per cent. of the employing bosses being now in the Employers' Association. The general opinion is that the demand of the men should be opposed, as, while many of the journeymen are worth and are al-

ready receiving 45c. to 50c. per hour, there are a large number who are not worth the increase. The new arrivals from the old country, "bronchos," as they are called, require a considerable training before they are of service on the class of work done here.

Now that the great bulk of the masters have gotten together on the question of journeymen's wages, they should take steps to make permanent their organization. If the standard of the trade is to be maintained an association is necessary.

WHAT OTHERS THINK OF US

From all parts of the country letters of congratulation have come as a result of the announcement that the publication of The Plumber and Steamfitter of Canada would be undertaken by the publishers of Hardware and Metal. The letters were backed up by an encouraging number of subscription orders, it being made clear that the trade wants a paper devoted exclusively to plumbing, heating and ventilating subjects.

The following letters, written by men standing high amongst the master plumbing and steamfitting fraternity in Canada, speak for themselves and show, in no uncertain manner, the approval with which The Plumber and Steamfitter commences its career of usefulness.

* * *

A Semi-Monthly Preferred.

I fully endorse your proposed publication and can see a far-reaching influence in a paper of this kind. It seems to me that what is needed in the first place is to bring before the master plumbers the absolute necessity of organization, and personally I think the paper you are about to publish is just what is wanted to meet the case. It is my opinion that a semi-monthly would be more effective than a weekly, as our firm subscribes to the Plumbers Trade Journal, published twice a month, and we find it comes frequent enough. When the paper leaves the printers I will look forward to a copy. Wishing you every success,

A. J. HAMMOND,
Ex-President National M.P.A.
Winnipeg, March 12.

* * *

Importance of National Cleanliness.

Your copy of The Plumber and Steamfitter received, and I am delighted to know that a Canadian firm is interested enough to issue a paper of this kind, that will give us local, provincial and Dominion affairs at first hand. You must be interested in different motives than present financial profit, as to the uninitiated in the journalistic field it would not appear to be a money-making proposition at the present time.

You must recognize the importance of the plumbing fraternity in helping in its development, and in the education of the people to healthful surroundings and the development of a healthful nation. As communities grow and become prosperous and densely settled it is necessary to have some forceful and influential means to bring the attention of law-makers to the importance of national cleanliness. Most legislators realize the necessity of personal cleanliness, but for them to take any interest in advanced methods and appliances for the disposal of waste matter is apparently outside of their jurisdiction.

The plumber has little influence either with the people or their representatives

LEWIS LEGROW, TORONTO.
Former Secretary Ontario Master Plumbers' Association.

in securing the enforcement of laws in the interest of health. If we (the plumbers) can be brought to a point where we will understand that our profession is of the most absolute importance, and the public can be brought to realize the same, then you give a new principle to life as applied to the public and the trade, that one will become conscious of the necessity of the other without the false idea that the cheapest method is good enough.

To develop this education a trade paper is of first importance, reaching people all over the continent and suggesting questions and problems that demand consideration and enquiry. It also will reach men of some importance and political influence. Men raise monuments to heaven's population and forget the necessity of earth's people who have to live without proper sanitary arrangements.

This sentiment is not caused from selfishness, but from a lack of knowledge. The same inspiration that causes men to honor the memory of the dead would also cause them to promote the happiness of the living by supplying bathing privileges, etc. if they but understood the necessity for it, and a trade paper, with unselfish arguments, is the best method of imparting this information.

Our country is growing so fast that without the influence of specialized papers, conducted by men who have a genuine interest to promote a better condition of sanitary appliances and furnish the information where these articles can be procured, by bringing the attention of our profession to the most important and absolutely necessary articles in forming homes—that without a special source of information many of us in the business would not measure up to the demands of the increasing population and its requirements.

LEWIS LEGROW,
Former secretary Ontario M.P.A.
Toronto, March 19.

* * *

Wants Canadian News.

I think a weekly paper such as you propose publishing is greatly needed in Canada, and should prove of great benefit to the plumbers throughout the land. At present, our trade journals come from the United States, and while we get valuable information from them they do not give the local news in which we are specially interested. What we need is a paper that will give us news and practical experiences of plumbers in our own country, as well as keep us posted on the work the various Canadian associations are doing. Such a paper would, in my estimation, be well supported by the Montreal trade. Wishing you the success you deserve.

NAP. TURCOT,
President Montreal M.P.A.
Montreal, March 13.

* * *

Need Something to Awaken.

Canada should be a good field for a trade journal devoted to the plumbing and heating interests. We certainly need something to awaken the plumbers and heaters of Ontario to be alive to their own interests, and that might be greatly assisted through a good trade journal. I will be glad to subscribe to your paper for one year, to assist you in getting started.

HARRY MAHONEY,
Treasurer National M.P.A.
Guelph, March 11.

* * *

Great Help to the Trade.

I am fully convinced that a paper devoted to our line of business, published in Canada, will receive the sup-

port which is due it, as I have found that all other papers that pertain to our trade vary from our line. Here in Ottawa we have an up-hill fight for the association, as the masters do not seem to take the proper view of the case. Also, as we are a mixed community, we find it hard to keep together. I am sure that such a paper as you intend to publish will be a great help to the trade and I have no doubht whatever will receive the support of the trade. I will be only too happy to subscribe and advance any help that is in my power to promote the welfare of the association and trade.

J. LIVOCK.

Ottawa, March 20.

* * *

Step in Right Direction.

It was with pleasure we heard of your intention of starting a plumbers' and steamfitters' journal, devoted exclusively to the trade in the Dominion of Canada.

A journal of that sort, conducted on able lines similar to Hardware and Metal, should prove both interesting to the public and lucrative to the publisher. A step in the right direction, it has our hearty endorsation and best wishes.

M. WALSH & CO.,
Per J. E. Walsh.

Montreal, March 12.

* * *

Wide Sphere of Usefulness.

As to the field there is at present in Canada for a journal devoted exclusively to the plumbing and heating trade, would say it may not be all that could be desired; still a good, live journal might, with the support of the trade, create for itself a very wide sphere of usefulness. Such a paper can be of material assistance to every man in the trade, by bringing to him that "to date" information which is so requisite in conducting the much abused plumbing and heating business.

J. E. FARRELL.

North Bay, March 11.

* * *

Serve to Revive Enthusiasm.

I learn of your purpose to publish a weekly journal devoted exclusively to the plumbing and steamfitting interests of the Dominion, and consider such a paper would serve to revive enthusiasm and general co-operation. The individual would see in it an instrument he could use to record the deeds and needs of his business. There is much reason to deplore certain existing conditions. That your effort will be well directed and ably sustained is an opinion which your exceptional knowledge and wide experience in trade journalism gives rise to. Trade conditions are bound to improve owing to awakened sympathy. May your earliest reward be a full subscription list.

Yours sincerely.
H. A. KNOX.

Ottawa, March 11.

SHOULD INTERCEPTING TRAPS BE COMPULSORY?

Ottawa's Plumbing Inspector Argues That They Should—Those Who Disagree With Him are Invited to Express Their Views.

By M. M. O'Connell, Plumbing Inspector, Ottawa.

The use of the intercepting trap should be made compulsory in plumbing systems.

First.—Because it reduces the cost of plumbing for the reason that valuable time is saved on both water and smoke testing jobs.

Second.—Also that in cases too numerous to mention I have found where no intercepting trap was on main drain, clean-out plugs had been removed for the washing of cellar floor and plugs had never been put back in their place, and in many cases they had been lost and houses were infested both with sewer gas and rats that had come from main sewer on the street.

Third.—Also where you have a plumbing system properly water and smoke tested, and where the climate is as severe as we often have it in different parts of Canada, I find the vents on roof freeze from the vapor carried in the air from the main sewer, with the result that when a closet, bath, basin, sink, etc. are used, the discharged water will form a vacuum in the pipes and cause a trap or two to siphon, allowing the sewer gas to contaminate the air of the house, and I have found it unbearable myself to remain in a bathroom where these conditions existed, and in many cases where they were next to or in sleeping apartments.

Fourth.—Another important reason why the intercepting trap should be insisted on is the carelessness of some owners, tenants, and some who call themselves plumbers, who dig holes in such a position in soil and waste pipes for clearing same when choked—that when the water is allowed to run through pipes after they are cleared that they do not leak water, but allow the sewer gas to enter the house, as they are seldom closed up properly.

Some Personal Experiences.

I may say, in looking through numerous plumbing by-laws, I often find that sewer vent pipes are allowed on a level from ten to twenty feet from windows, doors and other openings into the building they go through or adjoining buildings, and often when smoke testing I have seen the smoke carried from top of vent stack clearly thirty feet, and in winter time you can see the sewer air and vapor from same carried as far. You can easily see how sewer gas from main sewer can be carried into a building within from twenty to thirty feet where there is no intercepting trap on main drain.

Again, I have often seen when siphon closets were used as slop sinks, that they siphoned themselves almost when a pail of water was thrown into them, tanks is stopped up, or, from other causes will not refill the closet trap when same has been flushed, fill trap up properly, often only leaving a seal of a ½ inch of water in trap, and in those cases if vent on roof is partly or fully frozen up the back pressure will easily force sewer gas through trap of closet, etc., when there is no intercepting trap on main drain.

I have often gone into occupied houses where plumbers have been working for days and found the openings on sewer open to the atmosphere of houses, and the occupants forced to breathe such contaminated air while sleeping as well as in the day time. Some will tell you that disease germs, etc., are not carried into houses by sewer gas and that it is not very dangerous to breathe. I can recall some cases where plumbers and drain men have been overcome by breathing the air from sewers, and in these cases there were no factories, mills, etc., discharging into the main sewer in the vicinity that they were working in. Again, I have often been called to inspect plumbing on account of the bad smell in the house, and found that illuminating gas from gas main on street had entered main and house street sewer through defective joints on same, and then entered house through defective plumbing. In those cases I am of the opinion that intercepting traps placed on main drain would have been a blessing and would have possibly been the means of preventing much sickness and misery to those compelled to live under such conditions, for the reason that no matter how good the plumbing system is done to-day or at any time, it will not always stay perfect. Another reason why we should recommend the intercepting trap is that at any time a plumbing system can be tested where a trap is on the main drain at very small expense compared to the cost of testing plumbing system without trap on main drain.

Dangers of Sewer Gas.

We often hear the cry of sewer gas being blown out of fresh air inlets into people's faces by the opponents of the intercepting trap, and these same opponents will, in many cases, lead you, if possible, to believe that sewer air is not dangerous and that disease germs are not carried for any distance through a sewer, but will stop at the first obstruction. If such is so, let the first obstruction be the intercepting trap. My idea of modern sanitation is to keep the air of the house as pure as possible, and that the first thing expected of a plumbing system is that it shall not leak sewerage or sewer gas to house or near it, if possible, to meet the objections of those that object to the fresh air inlet as now placed. I would recommend, and I think it should have been enforced long ago, that the fresh air inlet should be carried up to the roof of building, and about three or more feet higher than top of sewer vent pipe, so that sewerage and air would flow in the same direction, and then we would have an ideal sewerage and ventilation system.

The above are some of the reasons which, in my opinion, indorse the necessity of an intercepting trap and fresh air inlet on all sewerage systems entering houses. In conclusion, I would say that in nineteen years' experience I never yet saw an intercepting trap freeze when fresh air inlet was properly connected to horizontal house drain on house side of trap, and that I have never seen an intercepting trap choked where modern plumbing fixtures were installed.

AMENDMENTS TO OTTAWA'S PLUMBING BY-LAWS

During recent months there has been considerable criticism of Ottawa's plumbing by-laws, and in order to bring about a helpful discussion in a paper which circulates amongst the trade in all parts of Canada the views of F. G. Johnson, Ottawa, president of the National Association of Master Plumbers and Steamfitters, have been secured. Mr. Johnson says:

"Referring to your letter wherein you ask my opinion regarding the existing by-law, I have delayed in replying as I wished to consider well before giving my opinion, so much has been said regarding house plumbing and ventilation.

"When the plumbing by-laws were first taken up by the Ottawa master plumbers we studied as many different city plumbing by-laws as were available at the time, and from them we chose what we considered as best suitable for our conditions, and we compiled them

F. G. JOHNSTON, OTTAWA

President of the National Association of Master Plumbers' and Steamfitters.

into what we are now using. Many details had been gone carefully into which did not give us much trouble to adopt. But this all-important question of ventilation, both for the dwelling and drains, had to be carefully considered. It had been the custom to use the house trap, and to do away with this was introducing something that could only be understood by practical plumbers and sanitarians. Many householders could not understood why they were compelled to do the ventilation for their neighbors, and many insisted on having the trap. In order to satisfy this class, a clause was inserted that a trap may be used with a breather, and outside vents carried up above all openings. This, of course, cost considerably more and had the effect of eliminating many of the traps.

"I am of the opinion our by-laws are fairly good as regards ventilation, and do not consider it necessary to alter or amend this clause. One matter which should be considered is that when repairs are made it is necessary to take out a permit costing $1, and following this the repairs must be smoke tested and inspected. With the inspection delays there are often days lost, which adds materially to the cost of the work. I would say all repairs or alterations on the sewer side of house drainage should be reported to the medical health officer, and if the inspector is a competent plumber he can soon discover any defects without such tests.

"I am pleased to inform you that the master plumbers have taken this matter up, and if our plumbing inspector can convince us of his proposed improvements in the plumbing by-laws we will gladly welcome such amendments, and will support him in his efforts to accomplish something which other cities have considered impractical. We expect the Board of Health will look closely into his views, and if he succeeds in convincing them that the intercepting trap is all he claims for it then he may expect a substantial increase in his salary. If, on the other hand, his views are on the tangent, then it is up to him to resign and make room for some more up-to-date inspector for the promising Capital City."

HAMILTON PLUMBERS SUED.

John Elliott is suing W. J. Clark, W. J. Walsh, James F. Cummings, James S. Kennedy, Alex. G. Miles, Stephen Mellon, Andrew Rogers, W D Smith, James H. Stewart, Hugh S. Wallace, Isaac Walsh, and W. J. Fitzsimmons for an accounting of the affairs of the Hamilton Master Plumbers' Association. When the association was active, Mr. Elliott became a member of it, paying a fee of $100. Later he withdrew. He says that he never got any benefits, but that the members who were fined paid the expenses, including a counsel fee of $500, out of the funds of the association.

NEW SUPPLY HOUSE IN TORONTO

E. A. Rogers, formerly city traveler for the James Robertson Co., Toronto, is forming the National Plumbing Supply Company, with a capital of $40,000 and is applying for letters of incorporation. He has secured premises at 15 Elizabeth street, Toronto, and after April 15 will be there with a full line of plumbers' supplies. Several important agencies are also being arranged for.

THE JAS. ROBERTSON CO.'S FIRE.

The warehouse and office buildings of the Jas. Robertson Co., at Winnipeg, were partially destroyed by fire April 6th. The loss is estimated at $70,000, well covered by insurance.

The blaze started in the rear of the upper floor of the old building, which is used as a warehouse. Owing to the inflammable nature of the material in stock, such as tar paper, building paper and farming tools, the blaze had assumed serious proportions before the firemen arrived, and even when they did arrive they could do very little until the roof of the building fell in. After this the fire was soon put out. The cause of the fire is unknown. The stock destroyed by fire included large shipments of spring goods recently ordered. The value of the stock destroyed will be above $50,000.

A HARD-WORKING PLUMBER.

Nap. Turcot, president of the Montreal Master Plumbers' Association, is a plumber and steamfitter worthy of the name. He is 39 years of age, having started in business for himself in

NAP. TURCOT

President Montreal Master Plumbers' and Steamfitters' Association.

the town of St. Louis, a suburb of Montreal, 20 years ago, in about the same locality that he is working today.

For several years he has been doing a business of about $50,000 annually. Some of the principal "jobs" placed in his hands were St. Sacrement Church. St. Denis Church and the Laurier Convent of Montreal. Mr. Turcot is also an alderman of the town of St. Louis (Montreal), and joined the association of the Montreal Master Plumbers the year it was organized, being elected president of this organization on his merits for the year 1907 at the recent election.

F. H. Herbert has completed plans for the King Radiator Co.'s new factory on Ashbridge's Marsh, Toronto, to cost $100,000.

Advance of Practical Sanitary Science

Written for this Paper by W. Holley, Associate Royal Sanitary Institute

ARTICLE I.

At the present time the water carriage system of removing liquid filth and human excreta from the interior and vicinity of premises in our towns and cities is regarded by all sanitarians as the best method of dealing with a difficult problem and the one most nearly approaching ideal treatment.

New towns as they spring up are having installed water supply and sewerage facilities sufficient to provide for

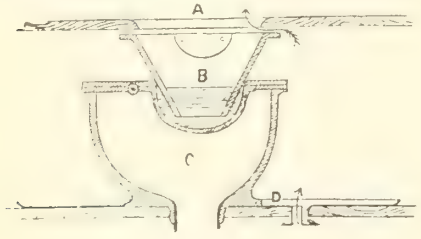


Figure B.

this method, and older towns which have not in the past had this system in operation are making such changes as to allow of its gradual introduction.

From an engineering standpoint many difficulties are encountered and many problems have to be solved in its introduction into an old town or in providing for its correct operation in a town which is being built, but from a sanitary and hygienic standpoint it has so much in its favor that almost any difficulties are compensated for by the far better results obtained over any other method.

It is not, however, within the scope of this few subsequent articles to deal with any of the larger problems, but to notice some points of interest to the plumbing trade and to the general readers of this journal arising therefrom—points, which in the writer's opinion, it is well to discuss.

As we look back over the history and experience of this system and notice its many failures and grand successes many lessons can be learned. It must be said that those who have been most interested in its successful operation have so kept pace with new ideas as they were demonstrated and so used them towards accomplishing their purpose, that at the present a fairly satisfactory system has been evolved.

One lesson,—and perhaps the most important—is that the best results are obtained by the use of the simplest appliances and parts. This is particularly noticeable regarding the closet fixtures, and as the installation of these fixtures forms a large portion of the work of the plumber, and is an important item to be considered in the construction of a dwelling, it will be profitable to devote this first article to notice this point at some length.

This simplicity, upon which good results so largely depend, must of course be based entirely upon a scientific basis, and when so based, the more simple the appliance the more chance of better results.

One of the earliest types of bowl was the straight hopper connecting directly to the drain, no means of flushing being provided, the waste waters of the building only supposed to be emptied down the hopper. This was followed by waste water pipes from the other fixtures of the house being connected to the closet bowl to provide some kind of an automatic flush with absolutely no regard as to sanitary connections from one fixture to the other. Very frequently the drain itself connected to the sewer with no disconnecting trap, allowing free passage of sewer air to enter into every part of the building.

Here were instances of simple appliances used in a very simple manner, but had to be condemned because of lack of scientific principle and application. It can better be imagined than described, the condition of affairs which must have obtained under these methods viewed from our standpoint of to-day.

Illustration B shows a type of closet pan with a water seal to disconnect the closet from the drain, a step forward to better conditions. In many cases, most cases in fact, these were flushed only by the waste waters which were emptied into the bowl.

It is inconceivable how this type of fixture could have been thought to be a good one, but such is the case. Thousands were installed and some few examples may still be found. In fact their use became very general and the fixture was regarded as the correct thing. Every time it was used the dis-

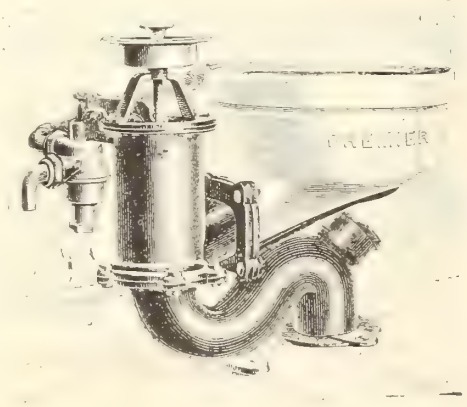


Figure D.

connection between the drain and the pan was entirely broken, allowing all the foul odors of the drain to pour forth and pollute the whole air of the apartment. The working parts and container (a) became so clogged with foul and filthy matter after very short use as to constitute an unmitigated nuisance.

The whole construction is opposed to that scientific principle of complete and quick removal of all waste liquid and solid matters from the interior of a building. From our present day standpoint it stands a complete failure but also as an honest attempt to deal with a difficult matter.

The "plug" closet was perhaps the

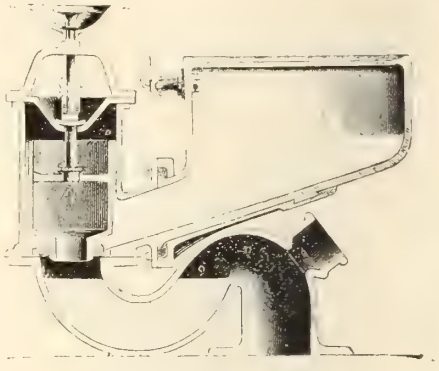


Figure C.

next and was very largely installed. Fig. C.

The illustration is taken from a large American supply house catalogue and almost fully explains itself. The chief object again was to provide a satisfactory water seal and receptacle to prevent the surface of the fixture becoming fouled. Experience has, however, demonstrated it to be a failure. It was impossible to prevent pieces of solid matter from adhering to the plug—match stumps, cigar ends, etc.—and preventing it from closing tightly, thus allowing the water to entirely escape from the bowl, and thus becoming fouled. Its moving parts became fouled after a time and were always a source of annoyance by breakdown, and so the fixture had to be condemned when used, as at first without trap it was worse than the original hopper because of the false security it inspired in the occupants of the house. Under whatever condition it was used it proved a very unsanitary appliance because of the difficulty to retain water in the bowl and the moving parts becoming fouled.

Following this we have the "valve" closet, a piece of well thought out and ingenious mechanism. Illustration D. These were used, or designed to be used, always connected with a fresh water supply, and by lifting or pressing the lever, the contents of the bowl were allowed to escape into the soil pipe or drain and the fresh water to enter into the bowl through the flushing rim. Part of this was used in flushing out the bowl and the remainder was retained to provide the receptacle for further filth and to escape in its turn by a further operation of the lever. The same re-

marks as used regarding illustration C are applicable to this type; in fact there are but some differences in detail. The plunger or plug is the essential feature, and of course the working parts just as easily foul, and the plunger is obstructed from reaching its seat as

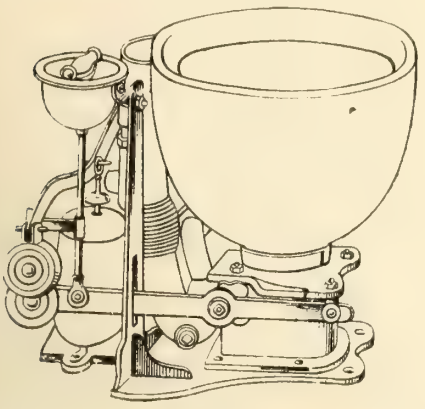


Figure E.

easily as with the previous type. The idea of retaining a larger amount of water in the bowl was perhaps the most important feature of this type. The illustration is taken from an American catalogue of 1888, and this type figured largely in the design shown. In the same catalogue, published in 1897, only one solitary cut was shown, the pattern having in the meantime been almost completely discarded.

A similar fixture was used in Great Britain up to a few years ago and at this time some few are still used, as shown by illustration E from a modern catalogue. It will be observed that the mechanism is even more complicated than the American valve closet. It is operated in a similar way by a lever at the side, which allows the contents of the bowl to enter the soil pipe and starts the flush. Most of the fresh water was retained in the bowl, which is provided with an overflow. The contents escape through the valve box immediately under the bowl and this pattern is some little better than the American, for the valve closes more surely, thus better maintaining the water in the bowl. Experience has demonstrated clearly, however, that these types are too complicated to be effective. There are too many working parts which become disgustingly foul and are constantly breaking down. The pendulum would seem to have swung to the other extreme and instead of having simple but unsanitary fixtures, we had very complicated and still unsanitary fixtures. To that must be added the necessity of having the fixture boxed in which today is entirely opposed to the best sanitary practice.

This leads us to the consideration of a pattern of closet bowl, of which there are very many in use at this time in one or other modification of the form—the "washout." The idea of the design would seem to have arisen from the plunger closet; no doubt an attempt to overcome the difficulty already mentioned regarding that type.

In this case the water is self-contained in the receptacle provided to receive the filth and is made of such depth as to keep the surface of the bowl from fouling at that point, and yet, not prevent the flush from perfectly carrying away the contents. Of all closet bowls perhaps none has been so popular as this. Its introduction was decidedly a step forward in practical sanitation and more fully answered the requirements of a correct sanitary fixture than any previous form. It was a complete return from the complex to the simple, but with the results of the experience already gained on which this simplicity was based. It has no working parts, is simple in construction, and is much less liable to foul. Thousands are at this time successfully working and many are being sold, although the pattern has been much improved upon by newer designs, which are largely taking its place. There are, however, certain definite objections and certain defects which we will briefly notice.

Illustration F shows one of the earliest models, some of which are still met with. The chief objections applicable to this and to all models are that the

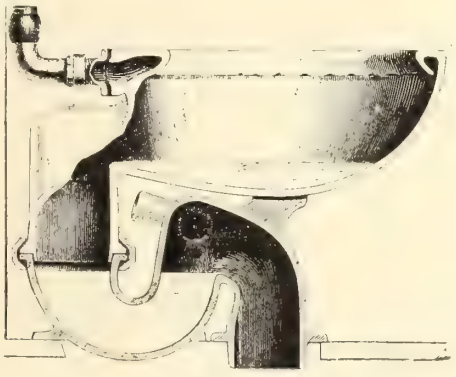


Figure F.

power of the flush to properly remove at once all deposits from the fixture through the trap into the soil pipe is largely defeated by its force being spent carrying the contents from the receptacle into the trap. It is entirely dependant upon the volume of water to accomplish this and frequently the necessary amount is not forthcoming, thus leaving after each operation solid filth in the trap, causing foul stenches to emanate into the room. If any lengthy period of time elapses between the operation of the closet, the nuisance becomes a very real one. This fact is clearly demonstrated in situations where the quantity of flush is governed by the length of time the user holds the valve from the supply tank open, as compared with places where the flush is delivered by syphon valve. In the first instance it would seem to be too much trouble to hold the valve open sufficiently long to properly remove the contents out into the soilpipe with the result already mentioned. When installing such a bowl it should be carefully planned that not less than five gallons of water be delivered into the bowl after each using, if the fixture is to be clean.

In this particular type the outlet into the trap is at the back of the bowl, which further operates against a clean and positive flush. Another real objection is that the exterior of the bowl lends itself to the accumulation of filth and cannot be easily cleansed. The fact of this fixture being made of two pieces as in this first instance, is also a great disadvantage, for experience has proved that a watertight joint was very rarely made, resulting in damaged floors, and ceilings, any time the trap became blocked. An attempt was then made to improve this by laying the trap enclosed within the porcelain when fixed, but the same very real objections obtained; in fact were more exaggerated.

Fig. H shows a modification of this pattern, which is perhaps the most common type, being in common use in Great Britain, Canada, United States, India, and elsewhere at this time. It is here shown with a trap vent as well as after flush chamber, but this type is made and used without either. The question of venting will form the subject of a subsequent article, as it is a most vital question in sanitary science, but here it will be well to notice that in all cases of "washout" bowls the depth of seal in the trap is extremely small; it cannot be otherwise if the fixture is to successfully operate, for the force of the water is largely spent in doing other work than flushing the trap, viz., carrying the soil into the trap. It will, therefore, be readily seen that in cases where no vent is provided a syphoned trap is not very difficult.

Regarding the afterflush, a point worthy of consideration in this North American Continent is the liability of fracture of the chamber from the body of the bowl through the formation of ice within, when installed in exposed positions. The holes from the chamber to the bowl are frequently not quite

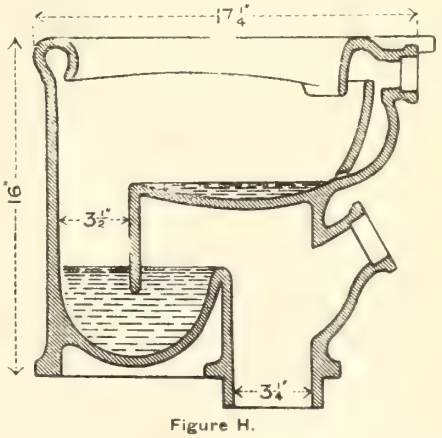


Figure H.

at the bottom of the receptacle, thus allowing water to remain which freezes and expands and thus forces the chamber from the main body. This fact is worthy of note and is a real danger in exposed positions.

In the writer's opinion this "washout" pattern when provided with a suf-

ficiently large flush, say not less than five gallons, and when properly vented, and the vent in good condition, is fairly satisfactory. The more recent designs of bowls, though, are so much in advance from a sanitary standpoint that it is a wonder so many of this type are still sold.

The London (England) County Council's action regarding this bowl is worthy of consideration. Within recent years they have entirely prohibited its installation within the area of their jurisdiction, and very many in operation have been condemned and had to be removed. The reason is that without a very copious supply of water for flush it is impossible to keep the fixture in a sanitary state and it is impossible within the metropolitan area to allow the use of the required amount. Two gallons at each flush is the amount allowed and bowls are in use which give almost perfect satisfaction with that amount. It was found to be almost possible to prevent filthy matter from adhering to the interior surface at A which after a short time causes a constant stench to be emitted.

The uses of a bowl which will properly cleanse with a smaller expenditure of water than another is in many respects of great advantage to a city's authorities, a fact particularly obvious when water supply is limited, or sewers too small.

THE PLUMBING OF A COTTAGE

By J. A. F. Cardiff in the National Builder, Chicago

Water Supply.

In the cut below we illustrate a plumbing section showing a system of piping for the supply and distribution of cold water, taking the supply from the city water main. The illustration is intended to serve as an example for the installation of the piping of a modern cottage having the usual amount of plumbing fixtures, and also includes the use of a pressure regulator and a water meter.

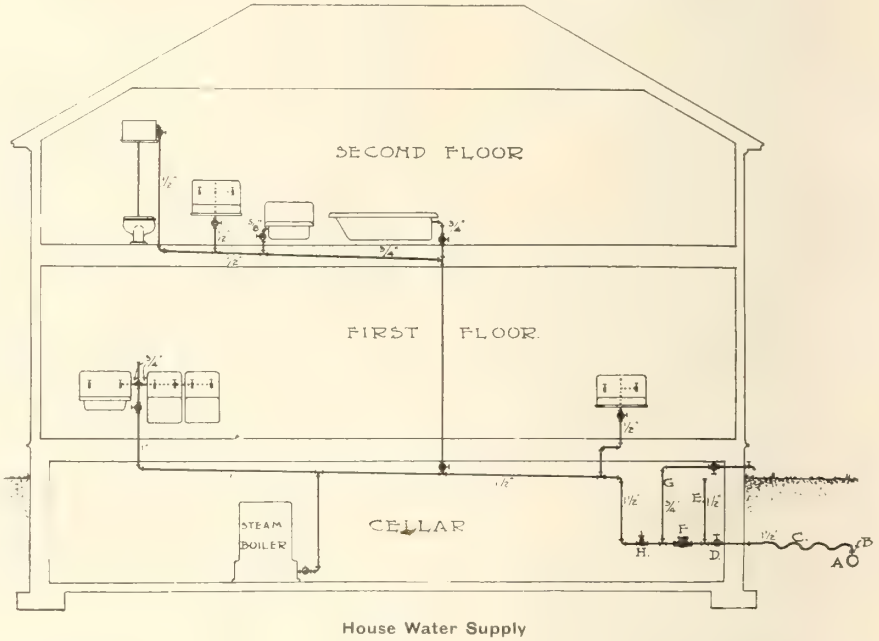
The pipe is galvanized wrought iron, except the service connection. Lead pipe for water supply is no longer used.

Taking up the work in detail, we indicate the city water main in the street at "A." The connection to this main is made by an employe of the city or company that owns the water system. This is done by drilling the street main and screwing in a brass corporation cock, "B," to which the service pipe, "C," is connected. The drilling of the water main and the insertion of the corporation cock is accomplished without shutting off the water in the mains, by means of a device especially made for the purpose.

The size of the corporation cock which may be inserted in a street main is usually determined by the municipality water department or the water company. In New York city the largest tap permitted, except when water meters are installed, is $\frac{5}{8}$-inch in diameter, and in other cities seldom exceeds $\frac{3}{4}$-inch in diameter. The diameter of the service pipe, however, should not be governed by the size of the tap, but should be determined solely by the amount of water required for the building.

The service connection, "C," should be of lead pipe and bent in a wavy form, as shown, so as to be flexible and thereby give and take with any settlement of the building or the street main. The plumber should furnish the mason with an iron pipe sleeve to build in the wall at the point where the service connection will pass through it. This is much preferable to leaving a hole in the wall or cutting one when the piping is being installed.

At "D" is shown the valve which shuts off the entire piping system. At "E" is provided an air chamber to absorb all shocks that occur in the pipes, and protect the meter, "F," from them. Water meters are used to measure the quantity of water which passes through the service pipe to the building. They are required in many cities where the water tax is determined by the amount of water consumed.



House Water Supply

At "G" is shown a branch taken off the main house supply to feed a sill cock located on the outside surface of the building and used for cleaning sidewalks, sprinkling lawns, etc. The branch is fitted inside the wall with a shut-off valve with a drip, and when the valve is closed the water in the pipe between the valve and the sill cock passes out through the drip, leaving the pipe empty. If this water was allowed to remain in the pipe it would be likely to freeze, because of its exposed location.

At "H" is shown a pressure regulator, which is a device required when the minimum pressure in the street main is greater than is required to raise the water to the highest fixtures. By means of this regulator the excessive pressure may be reduced so that it is just sufficient to supply the highest fixtures. A greater pressure than this would cause considerable annoyance and wear and tear on the piping.

When a pressure regulator is installed on a water supply system, a relief or safety valve should always be installed on the hot water supply boiler to provide relief for the excessive pressure generated by the water heating apparatus. This is necessary for the reason that the pressure regulator is similar to a check valve, in that it would prevent any excessive pressure generated within the building from finding relief through the service connection and street main.

The sizes of pipe are determined in general by the number of fixtures and the pressure of water in the main. For a low pressure, that is, a pressure not exceeding 20 pounds per square inch, the sizes given in the illustration are about right. The pipe is reduced in size in the manner indicated as the various branches are taken off.

The Canadian Brass Manufacturing Company, of Galt, has been incorporated with a capital of $40,000, to manufacture and deal in brass goods. The provisional directors are: W. L. Lefavor, F. E. Brown, and L. J. Osborn.

NEW BRASS WORKS.

The General Brass Works, Toronto, have secured a permit to establish a brass foundry on Sterling Road, for the manufacture of brass goods, plumbers' and steamfitters' supplies.

NOTES.

The clock watcher gets let out first when trade gets a little slow.

The man who never argues with a customer is the most successful.

The fellow who thinks he controls the trade soon finds out he can't even control himself.

A polite "thank you" should complete every transaction. It satisfies the patron, and costs nothing.

DISPOSAL OF SEWAGE BY SEPTIC TANKS.

Address by W. B. Gray, at the twenty-fourth annual meeting of the National Association of Master Plumbers, Atlantic City, 1906.

The best authorities of to-day predict that, wherever possible to supplant them, common cesspools, of whatever nature, will in due time be things of the past. The septic tank process is the means which will be employed, even in small private installations.

The septic treatment of sewage may be considered a biological rather than a chemical process as its success is dependent upon presenting conditions which favor the rapid growth of certain bacteria. In the complete reduction of sewage by the septic method, bringing it to a harmless state, in the form of nitrates which plant life can take up, two forms of bacteria are employed—anaerobic and aerobic. Air and light retard the multiplication of the first of these. The second requires oxygen and multiplies readily in the open air. The tank or receiver proper is a sort of catch basin, made in form to favor the requirement for the propagation of anaerobic bacteria which reduce the sewage to simple compounds. The tank should be large enough to hold the output of about one day's use of the fixtures discharging into it. Light and air should be excluded. Warmth to a degree is essential, such heat as is common to a pit in the earth, closed at the top, with no unnecessary exposure, together with the heat of waste water and that generated by the action taking place in the sewage itself being sufficient to favor the process in winter weather of quite severe climates. Fifty-four degrees Fahrenheit has been stated to be the minimum temperature permissible in this tank, for little or no septic action can take place at lower temperatures. The waste water of baths and lavatories are not turned into the septic tank alone for the heat they bring, but also to secure dilution of the excrement and matter from other sources, which not infrequently carry too little water to favor the best interests of the process. Both the inlet and outlet of the tank should be arranged to be below the surface of the contents when the tank is full, so that the scum which generally forms on the surface will not be disturbed by entry or exit of matter. This scum, resembling wet ashes, helps to retain the heat and excludes light and air from the mass, all favoring the accomplishment of the purpose. The scum may be from a few inches to fifteen to twenty in thickness, according to conditions and nature of the plant.

The contents leaving this initial receptacle having, in it, been brought down from its complex nature to one of simple chemical compounds, principally nitrites, the completion of the reduction process and the change from nitrites to nitrates, is brought about by exposure of the matter to light and air, giving the aerobic micro-organisms a chance to get in their work. This would be accomplished by simply discharging directly into a stream, but a more rapid action is obtained by interposing an open shallow bed of broken stone or slag for the liquid to first flow through so as to break up and bring into contact with the air as large an amount of surface as possible before piping to a stream or otherwise. In this way a more complete reduction is certain before the matter reaches any final source of disposal.

The bacteria necessary to the process are always present in abundance in fresh sewage and no preliminaries are necessary to the operation as described. The resulting product is described as a harmless, colorless and odorless liquid. In this process, admission of air to the tank or lack of sufficient heat or dilution may result in a putrescent state of matter, as found in the common cesspool. As previously indicated, the septic process is not yet widely used, except for town sewage where it is rapidly gaining in favor. Here elaborate methods are adopted to favor the aerobic or oxidizing end of the operation, mostly through filters of special design, all aiming to secure absolute stability and harmlessness of the final discharge from the sewage disposal plant. Better acquaintance will doubtless develop much data bearing on the latitude of conditions under which it will successfully operate. From eight to seventeen days are necessary to set up septic action, according to season and conditions.

SUPPLY MEN LOSE APPEAL.

The long drawn out appeal of the now defunct Central Supply Association against the conviction registered against the organization on the charge of conspiracy with the Master Plumbers' Association has at last been decided, the Court of Appeal upholding Judge Clute's decision.

The fine of $5,000 stands therefore; but as the organization is now out of existence it may never be paid unless the former individual members see fit to contribute to the court or the legal authorities take action to collect the amount.

In dismissing the appeal, Judges Moss, Garrow and MacLaren assent, and Judges Osler and Meredith dissent, they commenting as follows on the case:

A Close Decision.

Justice Garrow in his judgment said: "It is common knowledge that the majority of large operations in manufacturing and dealing in the articles and commodities of commerce are now carried on by joint stock companies. Can it be imputed to the Legislature that the intention in preparing the net was to catch only the small fry? Surely not. Then, again, the section expressly extends to prevent combinations in, among other things, insurance, both life and fire. These subject matters are always carried on by joint stock or mutual companies or corporations. Insurance corporations are not expressly named at all, and, therefore, unless included in the term 'corporation,' found in the first clause of the section, could not under the construction contended for be prosecuted or punished. The theory of the Crown, apparently concurred in by the judge, is that prior to the incorporation there had been such a criminal agreement, first between the individuals comprising both associations before the incorporation of the Plumbers' Association in April, 1905, continued down to the incorporation in September, 1905, of the Supply Association."

Incidentally, Chief Justice Moss asks: "What were the motives that led to the incorporation? The association has no stock in trade, and carries on no business, nor does it buy or sell commodities. It does not profess to be an association formed for general benevolent purposes, and it can scarcely be regarded as a social club."

Justice MacLaren agreed, orally, with the Chief Justice, who said that but for the opinions of his two dissenting brethren he would have experienced little difficulty in coming to the conclusion that the judgment should be affirmed. He, however, sustained Justice Clute's judgment.

Dissenting Opinions.

Justice Osler, who dissents, says: "It cannot be too strongly insisted upon, nor too clearly borne in mind, that the applicants are not responsible, criminally or otherwise, for anything which took place before their incorporation on September 9, 1905. They are not heirs of the sins, or answerable for the misdeeds of their incorporated predecessors. For all these the members of the incorporated association are liable, and have, as we are given to understand, been prosecuted. The Crown had the right to prove the object of the incorporation, and acts done after the incorporation, as tending to prove a conspiracy between the two corporations, but the fact of incorporation alone would not be enough. The prosecution, however, went very far afield, introducing evidence which comprises the bulk of the record of unlawful acts and conspiracy committed by individuals, members of the old incorporated association years before these appellants came into existence. This, in my opinion, was absolutely wrong. In my opinion, the evidence of anything finally done or completed by these defendants after their incorporation is of so slight and flimsy a nature, if any evidence of that kind there be, that the learned trial judge, dealing with a criminal charge of so grave a character, ought to have held that the case was not made out, and should have acquitted the defendants."

For Sins of Others.

Justice Meredith, the other dissenting judge, says: "Bearing in mind the cardinal fact that the appellants were not incorporated until September 6, 1905, it seems to me impossible to avoid the conclusion that they were tried, convicted and sentenced, in a substantial measure at least, for the offences of others, committed long before the appellants had any sort of legal existence, and so were wholly incompetent to commit any crime or do any unlawful act. This is not only apparent from the whole course of the trial, but crops up throughout the reasons given by the trial judge for finding the defendants guilty, and, indeed, it is almost, if not quite, explicitly so stated."

PARAGRAPHS OF INTEREST

By C. E. Oldacre, Toronto

Plumbers who have interested themselves in the septic tank sewage disposal system have opened new fields and found application for their work not otherwise obtainable.

The operations of such tanks are mervelous and of far-reaching benefits to all communities and in application are innumerable.

They are adapted to residences, hospitals, schools, factories, barracks, villages and towns.

Plumbers who have advocated them have added materially to their business, besides conferring great blessings on the public. Those who have not looked into their benefits will find a valuable means of extending their field of operation in old and newly-settled sections.

Septic tanks meet with the highest endorsement of the medical fraternity, and plumbers will find physicians ardent exponents of their use.

Good Rule to Follow.

In single pipe steam work probably fitters have had occasion to note uneven and varying water lines on steam boilers on some heating installations. This is caused in the majority of cases by too small sized mains; that is, either too small flow or too small return, or perhaps both. Where either one or both are present, the water is liable to disappear from the gauge glass. A fairly safe rule to follow in moderate-sized jobs for the size of steam main flow and return is to multiply the diameter of the pipe by itself and this result by 100 and this will give you the number of feet of radiation that can be carried on the main, and then for the return make it one pipe size larger than one-half (1-2) of the diameter of the flow. Example: How many feet of radiation can be placed on a 4-inch main ordinarily? Multiply thus, 4x4x100, equal 1,600; showing 1,600 square feet of radiation as the maximum amount of one-half of four bring two, let the return be not less than 2½ inches.

Reducing Size of Pipe.

It is the best practice in steam work to connect the boiler with the full-sized outlet at the boiler, and if any reduction is required do so by means of a reducing elbow at the top end of the nipple leading from the boiler, instead of using a bushing immediately at the boiler. This will reduce friction and give much better results in many cases.

In hot water heating, to give equal circulation it will be found to advantage to take the branches off the side of the main, instead of from the top, especially for runs to upper floors.

Are House Traps Dangerous?

Knowing the great effect of currents of pure, fresh air on health-destroying germs, have plumbers fully determined whether the usual "house-trap" is of value? Many contend they are of no value, and their use should be prohibited by law, as it stops these very currents and at once defeats the object for which they are placed in position. Pure air is one of the greatest enemies of infectious germs.

Wall Radiation Best.

Wall radiators give off the greatest amount of heat for every square foot of heating surface of any radiators used to-day. One hundred square feet of wall radiation is practically as good as one hundred and twenty-five feet of radiation of the usual type. They are, however, not compact, and take up too much wall space, and hence are not capable of adaptation in the majority of cases, but where conditions permit will be found very effective.

In a good many sections of this country, as well as other parts of the world, great difficulty is experienced with the domestic water supply from the stoppage of pipes, water-fronts and connections by incrustations. Many cases of clogged, burnt or poor operating hot water connections and water-fronts have been brought to the attention of Canadian fitters. These are due to the solid matter held in solution by the water, and gives to such water the term or appelation "hard water." The amount of solid matter held in solution varies from 10 to 300 grains per gallon. These solids consist mostly of sulphite of lime and other salts held by the water in solution and are precipitated in various degrees of heat. The temperature for precipitation varies from 170 degrees to 300 degrees Fahrenheit. Where 60 gallons of water containing only 30 grains solid matter per gallon, are used in a day—not a very large amount—for one week, it means nearly 2 pounds of this solid matter that may be deposited. With this going on for any length of time it takes only a short while for the containing pipes, water-front and connections to become thoroughly clogged. How to avoid these incrustations is a very important question and brings to notice the necessity of using liberal-sized connections. Referring to this question from an economical standpoint, it might be interesting to note that it has been stated that London wastes one-third its tea through the hardness of its water. A thousand gallons of London water contains three and one-half pounds of chalk. Calculating from the total population of London it has been figured out that it loses from this cause alone £6,000,000, or approximately, $30,000,000, per annum in extra tea, soap, fuel and labor.

Good Sized Sewers Needed.

Sewers of liberal dimensions are necessary, not only to meet the demands of future conditions, but also to provide ample space for the sewage to be carried away and abnormal quantities of water from sudden down-pours of rain and sudden melting of snow and ice, and as well, that ample space may be provided for a proper circulation of air at all times throughout their entire course. Air is the great destroyer of microbes causing diseases, and perfect ventilation secures plenty of air. The air in the sewers of Paris—some of the largest in the world—is regularly tested, and the investigations show that no disease germs are contained in the air of these sewers. Likewise, the air of the Berlin (Germany) sewers shows that no such amount of disease germs is carried in the air of the sewers as is found in the air of the streets.

Early Heating.

It may be interesting to know that the first hotel in the United States to have steam heat was the Eastern Exchange hotel, of Boston, Mass, installed in 1845.

The first hot water radiators were patented by Thomas T. Tasker, Philadelphia, Pa., on March 9th, 1858. The first modern type of cast-iron radiators were patented by Nathaniel H. Bandy, September 22nd, 1874.

WATERWORKS BY-LAWS.

Wetaskiwin, Alta., ratepayers recently voted favorably on the following by-laws: To provide for the raising of the sum of $140,000 for the construction of a municipal system of waterworks and sewers. For the raising of the sum of $30,000, for improving and extending the municipal electric light and power plant. For $2,500 for buying a hospital site, and $10,000 for the erection of a hospital.

STEAM HEATERS FOR FIRE ENGINES.

The Pease Heating Co., Toronto, are installing steam-heaters at Lombard street, Bay street, Berkeley street, Portland street and Cowan avenue fire halls for the purpose of carrying steam to the fire engines. These new steam fire engine heaters are capable of putting 25 pounds pressure of steam on the fire engines, and work automatically. As the gong sounds and the horses are hitched on, the steam is shut off automatically.

WATERFRONT EXPLOSION AT PICTON.

The accompanying photos show the damage done by the explosion of the water front of a range in the Hotel Tecumseth at Picton recently. The lids of the stove were blown through the ceiling and broken to pieces, and the coal was thrown out over the floor. The explosion happened about 4 a.m., waking everyone in the hotel, and the building was saved from destruction only by hard work.

The following description of how the accident was caused and how the repairs were made, written by Arthur Desmarchais, of Picton, Ont., will be read with interest:

"The water front had 133 square inches of heating surface in actual contact with the fire, having sufficient capacity to give good results with a 50-gallon boiler attached to it. But it only had one 30-gallon boiler attached and only one half-inch hot water tap connected to it for the supply of hot water for the hotel and no safety valve attached to the boiler. The grate surface of the range was 165 square inches.

"Owing to the small size of the boiler attached to the big water front exposed to the big fire surface it did not take very long for the water to boil

Damage Done by Explosion of Water Front.

in the boiler and this was the only way for the hot water to travel back in the cold water main.

"One cold night the cold water main froze and the hot water having no place to expand something had to go and the water front burst. The water front can be seen on the left of the stove in an "L" shape.

"I have overhauled the job and have reduced the water front one-half the quantity of the old one, and also installed a safety valve on the boiler, and am satisfied that the stove is safe now.

"These photos were taken especially for your paper, and if I have made any mistakes I will appreciate it if other readers will write in your columns and rectify them."

PUBLIC BATHS AT HAWAII.

The following interesting data is quoted from the report on Hawaii of the Commissioner of Labor:

"Upon all the larger plantations public baths are conducted for the use of employes. Sometimes they are partly supported by the employers, and sometimes they are entirely private enterprises, except that the bath house is usually supplied by the plantation. On some plantations hot water as well as the building is provided. Other planters supply free the fuel for heating the water. In other instances the bath house is leased to a contractor, who supplies his own fuel and charges the employes from 26 to 35 cents a month for bathing privileges. The Japanese bathe daily. On some plantations the Koreans have adopted Japanese customs in this respect. Hot water is used and a single large tub—in which both sexes bathe together indiscriminately—suffices for the needs of a number of laborers. Private bath houses, conducted in much the same manner, are common in the Oriental quarters of Honolulu."

FUNNY STORY FROM WALKERTON.

Thawing out a water pipe is about as exasperating a piece of business as putting up stove pipes, under the most favorable circumstances, and under certain other circumstances it is even worse, says a Walkerton, Ont., paper. Sam Hawthorne struck the very worst case of a frozen pipe the other night, and he lost a whole night's sleep over it. He had been out a little late that night, and when he went to get a drink there was no water. Concluding that it was a case of too much frost, he filled the kettle with water from the cistern and soon had it boiling hot. Then he poured it on the pipe, with no result. There was nothing for it but to fill up the kettle again and give the pipe another dose. This he did, but it still refused to run. This process was kept up steadily till five o'clock the next morning, and at last the water came gushing out. But what made Sam mad was that he learned later on in the day that the frost had nothing to do with the matter. The water had been turned off by the town constable, so as to increase the supply in the reservoir, and he had been operating on the empty pipe.

How the Back of the Range was Smashed.

WATERWORKS' SUPPLIES

The Toronto Board of Control appear to have become tangled over tenders for the brass work required by the waterworks department. Tenders are called for in November of each year and the contract awarded and begun by December 31, running for one year. The contract for this year has not yet been let.

On November 5 of last year tenders were called for, and three were received; from Keith & Fitzsimons and Dean Bros., of Toronto, and from the Niagara Falls Machine and Foundry Co. The Niagara Falls company's tender was the lowest of the three by $2,000. A deputation of brass workers appeared before the Board of Control asking it to decline to give the contract to the outside firm. After repeated protests the Board of Control asked for new tenders, this time there being a difference of only $975 between the contracts of Toronto firms and the Niagara Falls company. The board will now probably award the contract to one of the Toronto firms.

A bath tub for every public school in Toronto is the proposal that may come before the Board of Education very soon. School officials think the idea a good one, and some of the trustees favor it.

A NEW INDUSTRY IN THE WEST

Pipe for Water Works Systems Made of Wire-bound Wooden Staves—Large Industry Being Built Up—Exporting to Other Countries.

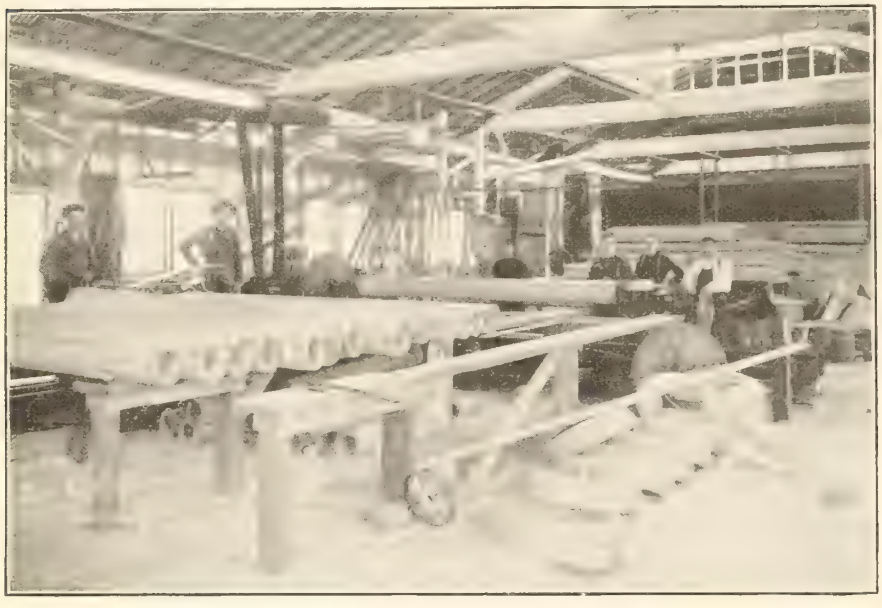
By G. S. B. Perry, Vancouver.

What may be classed as a new industry in the West, and one which has been gradually finding field for development as the towns of Western Canada have grown in the past four years, is the manufacture of water pipe from the famous Douglas fir of British Columbia. This material lends itself peculiarly to the construction of stave pipe, because of its wonderful quality, being so clear and straight grained and free from all defects. It is possible to secure a class of timber in B.C. which is absolutely free from knots, pitch pockets, shakes, or other defects common in almost every other class of timber. This perfect timber is used in making machine-banded wood stave and water pipe.

The product, which is being turned out by the factory of the Pacific Coast Pipe Company and the Canada Pipe Company in Vancouver, is finding favor with the wonderful growth that characterizes the West.

Machine-banded wood stave pipe has been constructed in the United States for many years. The first factory was in Eastern New York State, and many towns have systems installed with this product many years ago. In the West, the wood stave pipe of machine-banded construction has for many years been made in the State of Washington, where the class of timber is practically the same as that in B.C. It is this splendid material, which makes it possible to turn out such a high-class pipe at a price so much lower than any other pipe made. It is in fact a specialty, and no other timbered region in Canada can ever turn out the class of product which is being made in Vancouver from the Douglas fir.

The machine-banded pipe is made in



Making Wood Stave Pipe at Vancouver, B. C.

in the entire West, and has even been making its way in Eastern Canada. As a material at once cheap and reliable and satisfactory for water-works construction in towns and cities, the wood stave pipe is recommending itself to those numerous towns in the new West which find themselves with perhaps very moderate means, compelled to instal an entire new system of water supply. The conditions in the West are such that very young communities have to undertake public works of this kind which much older towns in the east have not yet thought of.

Naturally, when such heavy responsibilities are to be undertaken, with their burden of taxation, economy as well as efficiency is a factor of very great importance. In this way, many towns in the new provinces of Western Canada are being enabled, through using wood stave pipe, to instal very complete and high-class water-works systems at very low cost. The number of such towns where modern improvements are demanded increases year by year—

all sizes from 2 to 24 inches, internal diameter, and is also constructed for all pressures, from mere conduit pipe, suitable for irrigation, up to several hundred feet head. In making the pipe of these different pressures, there is no difference in the quality of the material, the banding being the only change, the construction being exactly similar. In all cases the pipe is positively guaranteed to stand the pressure for which it is supplied.

Many eminent engineers, including some of the most prominent consulting engineers in water-works construction in Eastern Canada, have expressed themselves as heartily in favor of the wood stave pipe. Its use is so extensive now that there is no question of experiment in it, and the fact that it has been used so many years with extreme satisfaction is proof that the claims of the manufacturer are well substantiated.

The Pacific Coast Pipe Company have well equipped and very conveniently arranged factories in Vancouver, their headquarters, and many Canadian engineers, and members of the Canadian Manufacturers' Association inspected the works the past summer on the occasion of the visits of the engineers and the manufacturers to the Coast. The process of manufacture is simple, yet part of it is a specialty, and skilled men are employed, while not a section of pipe is turned out which has not had the most watchful supervision in the various steps of manufacture. This care and excellent workmanship is the pride of the manufacturers and they unhesitatingly refer all inquirers to the many cities and towns which have used their product in the three seasons it has been made, since the factory was established.

NATURAL WATERWORKS SYSTEM

The artesian well belt of South Dakota is now attracting special attention because of the recent development of a number of wells containing hot water sufficient for the operation of hot water heating plants. This feature in addition to the cold water artesian wells for irrigation purposes in the arid sections of the state, which have also shown a bountiful suply, has enthused the residents of the commonwealth to a high degree. It is declared to be evident that South Dakota is underlaid with a natural waterworks system. The promise is held forth that in addition to abundance of water for irrigation, homes, live stock and crops, hot water for domestic purposes and heat is soon to be added. Water power for the driving of reasonably heavy machinery is among the possibilities. In fact on many farms to-day artesian water power is utilized to operate corn shellers, separators, shredders and other rural machinery.

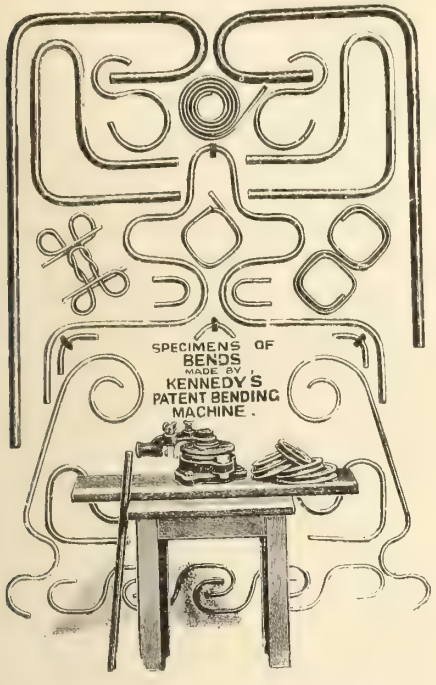
Recently contractors who sank an artesian well for the Chicago & Northern Railway Company at Midland found that the water which came to the surface with great force had a temperature of 135 degrees. This water, piped to residences, where it would go by its own force, would furnish all the heat desired. There are now in South Dakota about thirty artesian wells, 400 feet deep, sixty-five over 1,000 feet deep and two 2,500 feet deep. At Aberdeen the sewage is pumped away by power obtained from an artesian well, and elsewhere in the state electricity is generated for power and light purposes.

A. A. Horton, district hydrographer of the United States goelogical survey, says: "Artesian wells are certainly doing great things for the Dakotas and Montana. But I fear the flow of water will never reach sufficient power to operate heavy machinery. There is hot water in the belt now, lots of it. But no one can tell how long it will last."

The United Brass Manufacturing Company, of Cleveland, Ohio, have recently bought out the Wipe Joint Machine Company, manufacturers of the Corcoran wipe joint machine, and will in future continue the manufacture of this specialty which has been a conspicuous success from the start.

A USEFUL MACHINE.

The Kennedy Patent Bending Machine, samples of which are carried by Thos. Robertson & Co., Craig street, Montreal; Jas. Robertson & Co., King street, Toronto, and J. A. Bernard, 21 St. Peter street, Quebec, and the Canadian agency for which is held by Wm. O. Greenway, 13 St. John street, Montreal, is a line which should find favor among the trade in all parts of Canada.



Work done by the Kennedy Bending Machine.

The Kennedy Bending Machine is used by general engineers, electrical engineers, gas fitters, plumbers, etc., for bending welded, butt jointed and seamless tubing; also round, flat, angle, tee and channel bars in copper, brass, iron and other metals.

This machine, like the tube vice, stocks and dies, etc., will undoubtedly become one of the pipe-fitters regular tools, included in his kit and taken out with him on every job.

Any number of bends can be made at any angle and in any position on long lengths of work, doing away, to a large extent, with stock elbows, bends and sockets, also saving a large amount of cutting and screwing, thus reducing the possibility of leaky joints. Tubing within the dimensions stated below are bent cold without annealing or loading in any way.

The advantages of the machine may be summed up as follows: Makes a smooth, neat and more finished job; saves cutting and screwing; saves stock bends, elbows and sockets, causing ugly and possibly leaky joints; tubes bent cold without bulging, and yet without loading or annealing; any number of bends made on a single piece of work; repeats bends exactly; compact, yet portable and strong, can be fixed to any bench.

The machines have been supplied and are giving every satisfaction to many large establishments in Great Britain, including government institutions, gas works, railway companies, engineers, plumbers, etc.

Some good agencies are still open, and any wishing further information, re handling the bender in other districts, should address Wm. O. Greenway, 13 St. John street, Montreal.

PUBLIC COMFORT STATIONS.

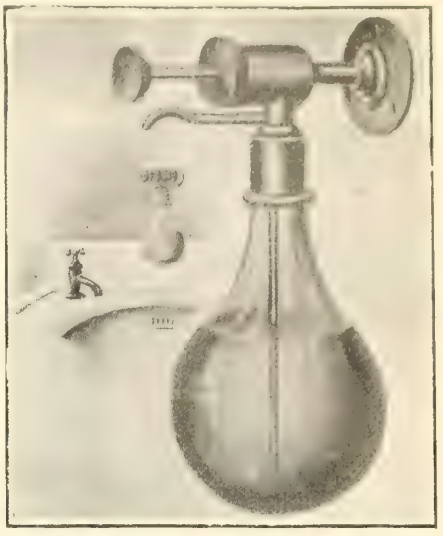
A report has been issued as to the hours and wages of the men employed in the public comfort stations in Toronto. There are two men at the corner of Cottingham and Yonge, one working from 6 a.m. to 5 p.m., receiving $12 a week, and the other working from 5 p.m. to midnight, and receiving $8 per week. At Spadina and Queen there are two men working the same hours and receiving the same pay. At Adelaide and Toronto streets there is only on caretaker. He works from 8 a.m. to 6 p.m. week days only, and receives $8.50 per week. On Sundays the men at the Cottingham and Spadina lavatories work from 9 a.m. to 3.30 p.m., and f 3.30 to 10 p.m., two shifts.

URINALS.

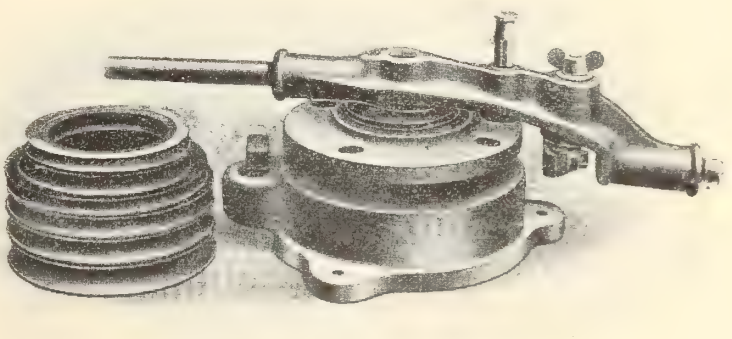
An automatic flushing device which will be economic in the use of water, and which will at all times insure sanitary conditions, is the purpose of a new urinal patented by A. Johnson, Lincoln, Neb.

LIQUID SOAP HOLDER.

Physicians have often pointed out the dangers of using cake soap in public lavatories. Good soap, undoubtedly, possesses antiseptic qualities of a mild character, but it is unable to cope with the germs o fa virulent disease, and, as a consequence, it often plays an important part in communicating contagious diseases from one person to another. With the purpose of overcoming this evil and insuring a clean supply of soap, the soap holder shown in the accompanying engraving has been invented. It consists of a bottle in which soap in liquid form is contained. Screwed to the neck of the bottle is a plug, which supports a piston cylinder. The plug is formed with a port, which opens communication between the rear of the cylinder and the interior of the bottle. A tube in the bottle, which reaches almost to the bottom of the receptacle passes through the plug and communicates with a port. The plunger which fits closely into the cylinder, is normally held in the outer position by means of a coil spring. The outer end of the plunger is fitted with a push button. The cylinder is formed with a bracket, by means of which the device may be readily fastened to the wall or other support over a basin. In use, the push button is pressed, compressing the air in the bottle and forcing some liquid soap up through the tube and out of the spout. The operator may be assured that the soap is perfectly clean, as there is no way in which it may be contaminated. Aside from the value of this device, in preventing the dissemination of disease germs, it prevents an undue waste of soap, for, as is well known, more soap is wasted when used in cake form, than is actually put to use. When the supply in the receptacle is exhausted, the bottle may be unscrewed and refilled without necessitating the removal of the piston cylinder and bracket from the wall. Not only can this device be used for dispensing soap, but it will be found equally useful for various toilet preparations. A patent on this liquid soap holder is owned by the Bender Manufacturing Company, Philadelphia, Pa.



Liquid Soap Holder.



No. 2 Bending Machine with Double Lever.

BUILDING ACTIVITY THROUGHOUT CANADA

Rosthern, Sask., will build a $15,000 town hall.

A large new hotel will be built at Strathclair, Man.

Peterboro will build a new $55,000 collegiate institute.

Regina will spend $125,000 on pavements this year.

Building permits in Winnipeg during March total $710,479.

The new Vancouver courthouse to be erected will cost $300,000.

A waterworks plant will be erected at Welland, to cost $70,000.

Methodists of Springhill, N.S., will erect a new $9,000 church.

A $75,000 hotel will be built at Moose Jaw by the C.P.R.

Methodists of Springfield, N.B., will build a new $9,000 church.

Building permits issued in Vancouver during March totalled $460,970.

The C.P.R. will erect a new $200,000 station at Calgary this summer.

Mr. Shipley, Vegreville, will build a $5,000 hotel at Holden, Alberta.

Building permits issued in Toronto for March aggregated $1,508,530.

Permits amounting to $518,561 were issued at Montreal during March.

A new Masonic Temple will be built at Fort William to cost $30,000.

The Ottawa Collegiate Institute will be enlarged at a cost of $100,000.

A new Methodist church is to be erected at Victoria at a cost of $25,000.

Baptists of Fort Rouge, Man., will erect a new church costing $30,000.

Building permits issued in Stratford during March amounted to $56,875.

Herkimer St. Baptists, Hamilton, will build a new church costing $20,000.

St. Giles' congregation, Winnipeg, will build a new church to cost $35,000.

Building permits issued at Calgary during March aggregated $23,125.97.

A new Anglican church will be erected at Granby, Que., to cost $30,000.

The building permits issued at Vancouver up to April 1 total $4,233,910.

A new Jewish synagogue will be erected in Toronto at a cost of $6,000.

The Sovereign Bank will build a market branch in Toronto to cost $40,000.

Building permits to the amount of $63,000 were issued at Ottawa last week.

A new two-storey brick school will be erected in Indian Head, to cost $36,000.

Dallas Hotel, Lethbridge, will have its accommodation doubled at a cost of $6,000.

Wentworth County Council will erect a House of Refuge at Hamilton, to cost $40,000.

The new Central Presbyterian Church to be erected in Hamilton will cost $168,000.

The T. Eaton Co. will build a store on Portage Avenue, Winnipeg, to cost $110,000.

Plans are prepared for building operations in For William this year to cost $5,500,000.

The congregation of Central church, Hamilton, will build a new church, to cost $165,000.

The total value of building permits issued in Hamilton since January 1, are $600,000.

A new Anglican church will be erected at Fort William to cost between $35,000 and $40,000.

Building permits issued in Toronto from the first of the year to April, aggregate $3,071,840.

Jas. Coristine Co., Montreal, will erect a seven-storey office building, to cost about $82,000.

The building permits issued during the first week of April in Toronto aggregated $400,000.

A permit has been issued for the erection in Montreal of a general hospital to cost $35,000.

J. J. Walsh, Winnipeg, has taken out permits for the erection of dwelling houses to cost $70,000.

During the week commencing March 23 permits for houses, issued in Toronto, totalled $306,000.

Public Works Department, Ottawa, is asking for tenders for erection of a post office at Fernie, B.C.

The Agricultural College at Guelph will have $75,000 worth of buildings added to its property this summer.

Alterations to the extent of $10,000 will be made on the Northern Hotel, Yonge street, Toronto, this summer.

The by-law for the purpose of developing electrical power for Shelburne, Ont., to cost $60,000 was defeated.

Bryan & Henderson have been awarded the contract for the erection of the Carnegie Hall at Lucknow, to cost $9,475.

Damage to the extent of $600 was done to the brass works of W. Coulter & Sons, Toronto, on Tuesday, March 12.

The congregation of Knox Church, Lethbridge, will erect a new church to cost $20,000 with a seating capacity of 600.

An automobile factory will be erected at Oshawa by the McLaughlin Carriage Co., employing between 50 and 100 hands.

The Mutual Life Insurance Co., New York City, have decided to build large offices in Toronto to cost about $1,500,000.

The contract for the new postoffice at Owen Sound has been let to Nagle & Mills, Ingersoll. The contract price is $63,424.

The Lethbridge, Alta., Knights of Pythias, in conjunction with a Calgary syndicate, will erect a new brick block in Lethbridge.

A wood-working plant is being built at Fort William by the Seamans-Kent Co., Meaford, to cost $100,000, and to employ 100 men.

J. & J. McDiarmid Co. has been awarded the contract for the erection at St. Bonafice, Man., of a new post office, to cost $20,255.

S. F. Whitham, Brantford, contractor for the new Normal school there, has taken out a permit for the building, which will cost $52,000.

Thessalon, Ont., has voted a bonus of $10,000 to the Saginaw Lumber & Salt Co. to assist the company to build and operate a saw mill in that town.

During the coming summer the G.T.R. will erect twenty new stations in Ontario, exclusive of the new Ottawa and Toronto depots, to cost $80,000.

H. Wineberg, Toronto, has applied for a permit to build a three-storey apartment house at the corner of Agnes and Elizabeth Sts., to cost $75,000.

A permit has been issued for the erection in Montreal of a five-storey building by Williams & Wilson, dealers in machinery supplies, to cost $47,000.

A three-storey building will be built on Adelaide street west, Toronto, for the publication of the Kennel Gazette and Poultry Review. It will cost $7,000.

Among the new buildings to be erected at Calgary this year are the C.P.R. depot, $25,000; the new city hall, $150,000; the new hospital, $60,000; the Y.M.C.A., the provincial normal school, the high school and registry office, $80,000.

The King Electrical Works, Montreal, has been incorporated, with a capital of $30,000, to carry on the business of manufacturers of and dealers in electrical machinery, brass, copper and other metals.

TOOK IT FOR GRANTED.

"I hear the newsboys yelling 'extra!' on the streets. Shall I buy a paper?"

"No, my nerves are in such a condition to-day I couldn't bear to read about a railroad wreck."

FORGOT THE AUTOMOBILE.

"Why do the poor persist in running down the rich?" shouted the new sociologist. "We never heard of the rich running down the poor."

"Gosh, mister," retorted the thin man in faded trousers, "you ain't never seen an automobile, have you?"

DIDN'T KNOW WHICH BAR.

"Where's the bar?" asked a dirty looking stranger of a waiter at a hotel the other day.

"What kind of a bar?" asked the latter.

"Why the liquor bar, of course; what do you suppose I mean?"

"Well," drawled the boy, "I didn't know but what you might mean a bar of soap."

NEWS OF THE TRADE IN CANADA

A. Joss, of Sarnia, was a visitor in Toronto last week.

John Brown & Son, plumbers, Sherbrooke, have dissolved.

The town of Aylmer will install a sewerage system, to cost $60,000.

H. Riendeau and J. H. Soly, plumbers, Montreal, have been registered.

The International Gas Appliance Co., Toronto, have gone into liquidation.

A factory of the Carriage Mountings Co., Toronto, will be erected at St. Catharines.

Purdy & Mansell, plumbers, Toronto, formerly of Adelaide street, have moved to 61-63 Albert street.

W. H. Latour and E. Guimdon, of the firm of Drapeau & Champagne, plumbers, Montreal, have been registered.

Building operations on the plant of the Standard Fitting and Valve Co., at Guelph, will commence at once.

Maxwell & Johnston, plumbers, Toronto, formerly at 117 Queen street west, have moved to 353 Queen street west.

G. M. Owston, sales manager of the James Robertson Company, Toronto, leaves this week on a holiday trip to New York and other points.

W. H. Meredith, sales manager of the Monarch Brass Manufacturing Company, Toronto and Port Colborne, is on a business trip to Winnipeg and the West.

H. S. Harwood, manager of the Toronto branch of the James Robertson Manufacturing Company, made a business trip to the head offices in Montreal last week.

Twenty-five plumbers employed by Wm. Mashinter, Adelaide street, Toronto, have gone on strike, complaining that the firm has failed to live up to its agreement.

Berlin's town council has granted the Dominion District Heating Co. a thirty years' franchise to use the corporation's streets for the installation of a central heating system.

The heating and plumbing contracts for the new Rose avenue fire hall, Toronto, have been awarded to the W. J. McGuire Co. The amount of the contracts is $1,350.

A plumber inspecting the gas pipes at the Collegiate Institute, Chatham, held a lighted match near a big leak resulting in an explosion, in which he was severely burned.

Simmons Bros., Kingston, engaged in the plumbing, tinsmithing and hardware business, are opening a new factory in that city for the manufacture of Gadne's Dustless Flour Sifter.

A new schedule of salaries for civic employes has been ratified by the city of Victoria. Hereafter the sanitary inspector will receive $80 a month and the plumbing inspector $100 a month.

W. Mashinter & Co., Adelaide street, Toronto, have issued a writ against J. Douglas and J. Chambers to recover $555.60 for certain plumbing and gas fitting in connection with the Traders' Hotel.

W. J. Wicksley, a helper in the employ of W. J. McGuire & Co., Toronto, met death in a very unusual way last week. He had been ill, and while falling in a faint with his face downwards in a pillow, he smothered to death.

The plumbing display in the recently rebuilt hardware and plumbing establishment of J. R. Myers, Stratford, is very attractive, being situated at the front of the ground floor. Mr. Myers will look after the plumbing department personally.

The Canada Foundry Company has been awarded the contract for Toronto's supply of cast iron pipe required for the coming twelve months. The prices are as follows: 3-inch pipe, $3.90; 4-inch, $5.40; 6-inch, $7.20; 8-inch, $10.75; 10-inch, $14.95; 12-inch, $19.65.

Wray & Morgan, plumbers and steamfitters, Toronto, have sold their stock to James Elliott, 838 College street, and have gone out of business, owing to the unprofitable condition of the trade in Toronto. Mr. Wray has gone to England and Mr. Morgan will summer at Rice Lake.

W. M. Mackay, secretary of the American Society of Heating and Ventilating Engineers, and formerly a Canadian, has won a high place for himself in the heating and plumbing trade in the United States. He has recently been appointed to the managership of the Mackay Mfg. Co., New York City.

The Labatt Manufacturing Company, of London, manufacturers of plumbers' supplies, has been incorporated with a capital of $200,000. They will manufacture plumbers' brass goods and woodenware. The provisional directors of the company are: John Labatt and H. F. Labatt, of London; H. J. Wood and D. W. Wilson, of Buffalo; and S. C. Newburn, Hamilton.

The King Radiator Co. have bought property in the northwest part of Toronto, on St. Helen's avenue south of Bloor street, and will erect a factory there. This action was taken by the company because the city's agreement with them, regarding establishing a factory in Ashbridge's Bay, was not favorable to them.

Hastings & Willoughby are a new hardware and heating firm starting business in Regina. For a number of years Mr. Hastings was foreman of the Smith & Ferguson Co., and he has a wide acquaintance among the trade and an enviable reputation as a heating engineer. The new firm are making arrangements for a number of agencies and have been appointed agents for the Pease-Waldon Co.'s line of warm air furnaces.

PLUMBING INVENTIONS.

J. A. Frey, Washington, D.C., has secured a patent on an automatic steam and hot water safety cock for use as an attachment to domestic water heaters and steam boilers or generators for relieving pressure of steam when it exceeds the limit of safety. It is adapted for use in the usual way for discharge of water from a heater or boiler to come into action only when the usual turning spigot is closed or adjusted to cut off discharge.

PLUMBING MARKETS.

The plumbing trade is recovering from the recent set-back caused by the severity of the weather and the supply houses report a booming business.

Despite the slashing done by one Toronto firm on enamelware prices, there have been few or no changes, owing to the steadiness of the metal market. With the exception of the fluctuation in copper prices a week or so ago, following the slump in the stock markets, prices on all the metals on which the plumbing trade is dependent for its supplies have been firm.

The scarcity of iron pipe is being felt throughout the Dominion and is becoming more acute, owing to the difficulty of the American mills in supplying skelp. They are now months behind in their orders, and any Canadian firms have to wait six weeks or a couple of months in getting their orders filled. The supply of small pipe, as ¼-inch, ⅜-inch, and ½-inch, is low at present. The present scarcity of pipe generally will probably last through the coming summer. Prices remain unchanged. The base price on one-inch iron pipe is still $5.12 for black and $6.77 for galvanied.

Prices on iron pipe fittings remain firm and unchanged with increasing demand. Soil pipe fittings are experiencing a good demand.

The price on lead pipe continues at 5 per cent. off list price.

Slashing in prices on enamelware continues, with one firm in Toronto, anxious to book up more orders, now giving an additional discount of 5 per cent. off their October prices, making their discounts now 30, 10 and 5 off list.

Another feature of the plumbing markets at present is the unprecedently low prices on radiation. Prices are still being cut to pieces owing to the strong competition going on between certain firms.

The prices on galvanized and copper range boilers continue firm and unchanged, with an increasing demand.

Solder continues firm and unchanged, the base prices being 27c. for half-and-half guaranteed, and 23c. for wiping.

A LONG FELT WANT.

We enclose you order duly signed for Plumber and Steamfitter for one year from date. We received a sample copy of The Plumber and Steamfitter last week and found same very interesting. It is something that we consider will fill a long felt want to our craft here in Canada and we are pleased to note the able writers whom you have secured as contributors.

W. J. McGUIRE & CO.

Montreal, March 19.

ROBERTSON'S MARBLE LAVATORIES

In addition to the goods illustrated, we manufacture and carry in stock a full line of staples, such as Brass Compression, Fuller and Ground Work, Soil Pipe and Fittings, Iron Pipe and Fittings, Engineers', Gasfitters', Steamfitters' and Mill Supplies. A Catalogue for each of these departments will be cheerfully forwarded on application.

The James Robertson Company, Limited

265 King Street West, TORONTO

Wrought Iron Pipe and Cast Iron Fittings

Our Stock in these lines is complete. Can fill all orders promptly. Be supplied before the Spring rush commences.

WM. STAIRS, SON & MORROW, Limited, HALIFAX, N.S.

We make Electric Fixtures, Sockets, and Cut-Outs

Munderloh & Co

Electrical Supplies of all kinds. MONTREAL.

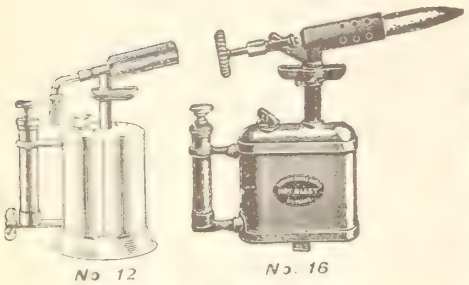
KERR'S GLOBE AND GATE VALVES
STRICTLY HIGH GRADE. TESTED & PACKED
THE KERR ENGINE CO. LIMITED
VALVE AND HYDRANT MANUFACTURERS
WALKERVILLE, ONT.

SCIENTIFIC DRAINAGE IN CAST IRON
HYGIENIC SANITATION CAN BE OBTAINED BY USING MACFARLANE'S GLASS ENAMELLED DRAIN & SOIL PIPES WHICH ARE RECOMMENDED AND SPECIFIED BY THE LEADING SANITARY AUTHORITIES
HYGIENE
WALTER MACFARLANE & Co.
SANITARY ENGINEERS.
CASTINGS SUPPLIED CUT & FITTED TO REQUIRED MEASUREMENTS
DRAINAGE PLANS ARRANGED
CATALOGUES ON APPLICATION.
SARACEN FOUNDRY,
GLASGOW.

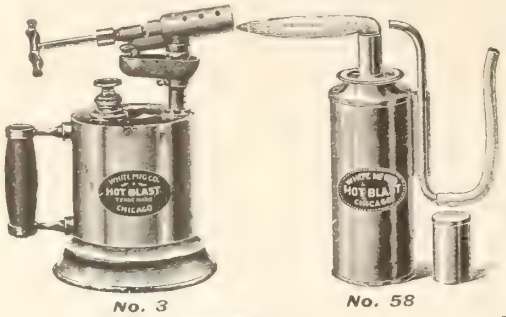
AGENTS:
W. PORTEOUS JACK, 1256 Robson, Vancouver.
GEO. PEATT & CO., P. O. Box 466, Winnipeg, Man.
BAXTER, PATERSON & CO., 102 St. Antoine St., Montreal.

THE TURNER TORCHES AND FURNACES ARE THE HOTTEST ON EARTH

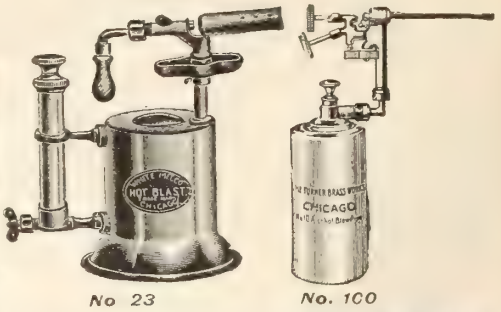
PROVE IT BY ORDERING A TRIAL SHIPMENT FROM YOUR JOBBER



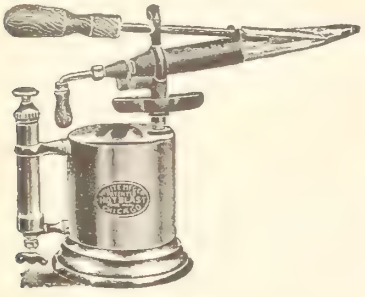
No 12 No. 16



No. 3 No. 58



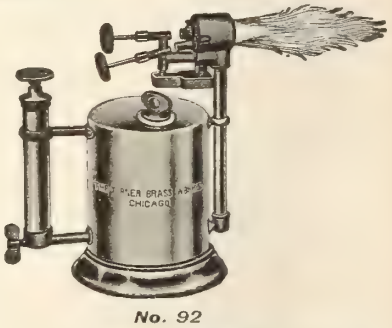
No 23 No. 100



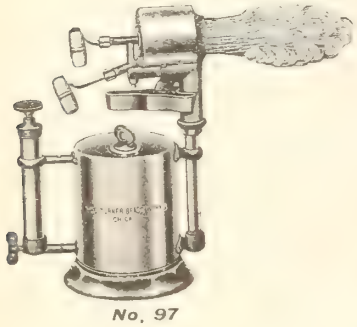
No. 21

No. 22

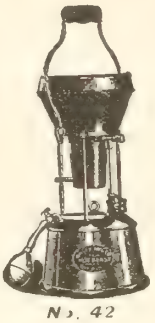
No. 54



No. 92

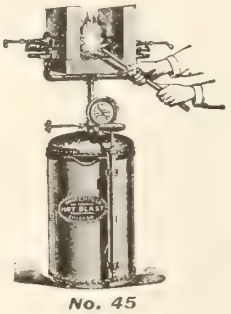


No. 97

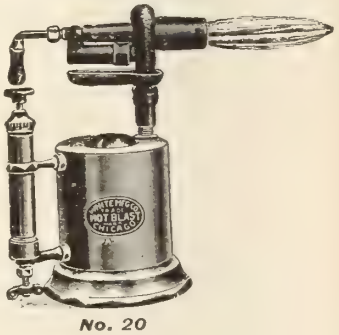


No. 42

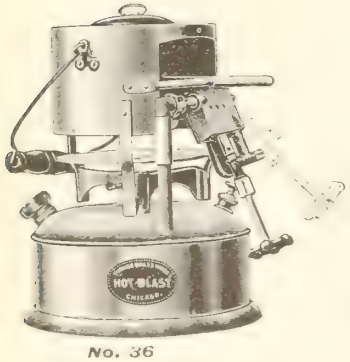
No 31



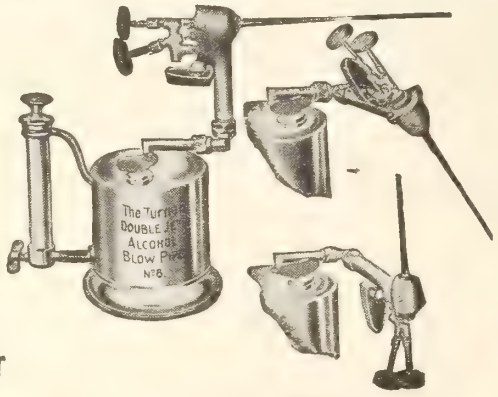
No. 45



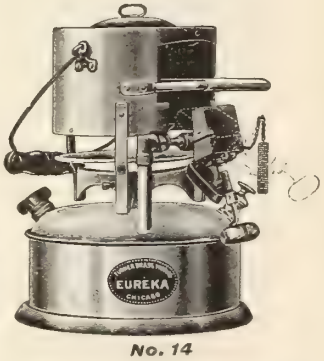
No. 20



No. 36



No. 8 Alcohol Blow Pipe



No. 14

No. 85

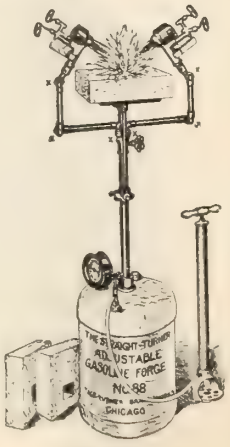
We make tools to meet the requirements of every mechanic. They are sold under our guarantee. We do lead burning on Storage Batteries with Nos. 8 and 100. Braze Cast Iron with No. 88. Braze wires on Rubber Tires with No. 92, etc. JOBBERS SELL AT FACTORY PRICES. If your Jobber does not carry a stock of our tools, write us. Our catalogue is free.

THE TURNER BRASS WORKS

53 Michigan Street

CHICAGO, ILL., U. S. A.

TRADE HOT-BLAST MARK



No. 88

PLUMBERS' BOOKS

HINTS TO PLUMBERS

on

Joint Wiping, Pipe Bending and Lead Burning

By

JOHN W. HART, R.P.C.

Third Edition, Revised and Corrected. 184 Illustrations, 313 pp.

PRICE $1.50.

Contents.

Pipe Bending, Square Pipe Bendings, Half-Circular Elbows, Curved Bends on Square Pipe, Bossed Bends, Curved Plinth Bends, Rain-water Shoes on Square Pipe, Curved and Angle Bends, Square Pipe Fixings, Joint-wiping, Substitutes for Wiped Joints, Preparing Wiped Joints, Joint Fixings, Plumbing Irons, Use of "Touch" in Soldering, Underhand Joints, Blown and Copper Bit Joints, Branch Joints, Block Joints, Block Fixings, Astragal Joints, Pipe Fixings, Large Brance Joints, Large Underhand Joints, Solders, Autogenous Soldering or Lead Burning, Index.

SANITARY PLUMBING AND DRAINAGE

By

JOHN W. HART, R.P.C.

With 208 Illustrations, 250 pp.

PRICE $1.50.

Contents.

Sanitary Surverys, Drain Testing, Drain Testing with Smoke, Testing Drains with Water, Drain Plugs for Testing, Sanitary Defects, Closets, Baths and Lavatories, House Drains, Manholes, Iron Soil Pipes, Lead Soil Pipes, Ventilating Pipes, Water-closets, Flushing Cisterns, Baths, Bath Fittings, Lavatories, Lavatory Fittings, Sinks, Waste Pipes, Water Supply, Ball Valves, Town House Sanitary Arrangements, Drainage, Jointing Pipes, Accessible Drains, Iron Drains, Iron Junctions.

STEAM AND HOT WATER FITTERS' TEXT BOOK

By

THOS. E. M'NEIL.

PRICE $1.00.

Contents.

Tools, Fittings and Pipes, General Questions on Heating, Low Pressure Steam, Two-pipe Steam Heating, Single Pipe Low Pressure Steam Heating, Indirect Steam Heating, Hot Water Heating, High Pressure Steam Heating, High and Low Pressure Steam Heating and Power Plant, Exhaust Steam Heating, Power Fan or Blower System of Steam Heating and Ventilating; Design, Estimate, Specification; Dwelling House Heating, A Successful Heating Job.

PRACTICAL HOT WATER HEATING, STEAM AND GAS FITTING, ACETYLENE GAS, HOW GENERATED, HOW USED

PRICE $1.50.

Illustrated.

Showing the latest and most approved Devices used, the value of Acetylene Gas as an Illuminant Discussed from Various Points of View; Every Class of Generator Described; Gas Burners and Piping; also the Best and Quickest Methods of doing Hot Water Heating, Steam and Gas Fitting, up to the Present Date.

By

JAMES J. LAWLER

and

GEORGE S. HANCHETT, S.B., M.A.I.E.E.

Addenda.

Complete Steam One-pipe Circuit System, A (insert); New Special Hot-water Distributing Fitting; Soft Coal Steam and Hot-water Heater, A.

MacLean Publishing Co.

LIMITED

MONTREAL TORONTO WINNIPEG

It's the

GLASS CONE

that makes this new burner a great success.

It gives full benefit of flame down to the very wick top.

FOR SALE BY ALL PROMINENT DEALERS.

MANUFACTURED BY

The Ontario Lantern & Lamp Co.

LIMITED

HAMILTON, ONT.

No. 7 Hand Drill

Cut gearing, change of speed for light or heavy work. Ball bearings, Rack and pinion feed, either hand or automatic. Treadle feed to lower the spindle to the work. A weighted lever raises the spindle instantly as soon as the feed is disengaged. Incomparably the best hand drill in the market, and also a first-class wood boring machine. Fitted for power if desired without extra charge. Weight 375 lbs. Send for circular.

It pays to use the best tools.

A. B. JARDINE & CO.

HESPELER - - - ONTARIO

...FULL STOCK...
Salt Glazed Vitrified

Double Strength Culvert Pipe a Specialty.

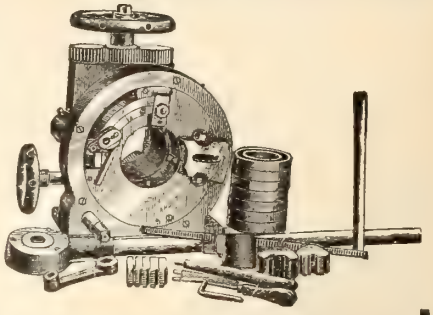
THE CANADIAN SEWER PIPE CO.
HAMILTON, ONT. TORONTO, ONT
ST. JOHNS, QUE.

This is the Mark that Means Something

It is the distinctive brand of genuine Armstrong Stocks and Die and Pipe Fitters' Tools.
No "Armstrong pattern" or "just as good as Armstrong" have this stamp. Don't buy anything in this line that hasn't this brand as it is the mark of genuineness.

THE ARMSTRONG MANUFACTURING CO.,
292 Knowton Street, Bridgeport, Conn.

A Certain Sense of Satisfaction



Goes with every MERRELL PORTABLE HAND MACHINE, PIPE THREADING and CUTTING MACHINE. We build them that way.

For doing ALL kinds of threading—under ALL conditions—labor trouble and faulty material included—where speed, durability and ease of control count for something, our word to you is to investigate the MERRELL.

Whether it be stationary or portable—hand or power driven—30 DAYS FREE TRIAL must prove conclusively that your choice should be the MERRELL.

This Portable Hand Machine has encased gears, MERRELL standard quick opening and closing die-head, and the latest improved Cutting-off Knife.

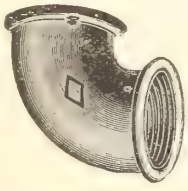
Let us tell you more about this machine—The Chasers, Vise and the large range of work covered.

Catalogue for the asking.
Quick shipments.

THE CANADIAN FAIRBANKS CO.
Sole Agents for Canada Limited
MONTREAL, TORONTO, WINNIPEG, VANCOUVER

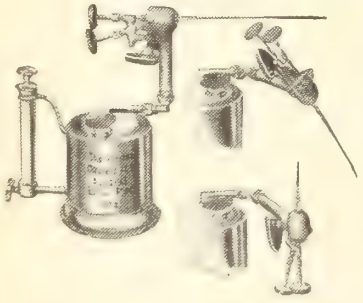
CLINCH YOUR TRADE and assure your profits by letting me know your ENAMEL-WARE wants. Quality and dispatch are the keynotes of my business.

ORLANDO VICKERY
178-180 Victoria Street TORONTO, CANADA



By Stocking
"Diamond" brand Fittings
you capture the paying trade. And you keep it.
WHOLESALE ONLY.

OSHAWA STEAM & GAS FITTINGS CO., LIMITED
OSHAWA, CANADA



HOTTEST ON EARTH

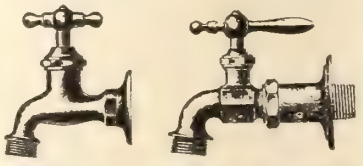
The No. 8 Alcohol Blow Pipe produces nearly 3000 F. Will do lead burning on storage batteries. Produces a needle blue flame pointed. Satisfaction guaranteed or money refunded. Jobbers sell at factory price, **$10.40 net.**

THE TURNER BRASS WORKS
53 MICHICAN STREET, CHICAGO, U.S.A.

Do You Want the Best?

TWO FREE
for every one sent you defective. Isn't that guarantee enough?

Glauber Brass Mfg. Co.
Expert Makers of Fine Brass Goods
CLEVELAND - - OHIO



The Canadian Bronze Powder Works
R. E. THORNE & CO.

The only bronze powder works under the British flag.
High Grade bronze powders and bronze liquids.
Can fill all orders at short notice.

MONTREAL — TORONTO
WORKS AT VALLEYFIELD. *NO ORDER TOO LARGE*

Forwell Foundry Co.
BERLIN, ONT.
Manufacturers of
SOIL PIPE, FITTINGS, and CAST IRON SINKS
Ask Jobbers for "F. F. CO." Brand

"Standard" Porcelain Enameled Sink, with Apron all around, Enameled Sink Legs with Wall Supports, Nickel-plated Strainer, Fuller Adjustable Flange Bibbs and "P" Trap with Waste and Vent to Wall, with or without Bibbs and Trap

Houseowners Know What

"Standard"

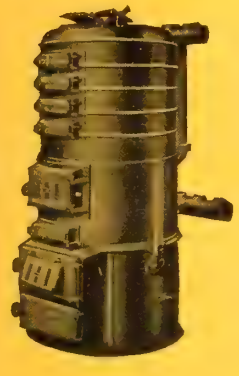
Stands For

In the public mind **"Standard"** and Sanitation are synonymous terms. Whenever you specify **"Standard"** Porcelain Enameled Fixtures for Residence, Hotel or Apartment House, you are assuring the owner that he will receive **what he recognises as the best** in the way of sanitary equipment. : : : : : : : : :

"Standard" Sanitary Mfg. Co.

PITTSBURGH, PA., U. S. A.

DEALERS made more real money by recommending "Sovereign" Boilers last season than was made by pushing the next best three boilers on the market. If you didn't get your share of the profits last year it's up to you to secure your share this year by talking The



"Sovereign" Boiler

because it is the nucleus of the most perfect heating system ever devised. We were perfectly convinced of that before a single "Sovereign" left our factories, but we waited for the verdict of Canada's practical men. That verdict, as most dealers know, was: **"The Sovereign is the Best."**

Have you read our **Profit Story ?**

TAYLOR - FORBES COMPANY, Limited

Head Office and Works: GUELPH, ONT.

TORONTO—1088 King St. West. **MONTREAL—122 Craig St. West.**

WINNIPEG—The Vulcan Iron Works, Limited

DAISY BOILER

TALK NO. 1

The name Daisy sounds familiar to most steamfitters. Men who to-day are owners of a flourishing business knew the Daisy over twenty years ago when its advent on the Canadian market revolutionized Hot Water Boiler Construction. As the Daisy stood a quarter of a century ago, it stands to-day—the acme of Hot Water heating boilers, the embodiment of simplicity, durability and efficiency.

Daisy

IT IS THE INNER BOILER THAT COUNTS—

A fire pot of ample size to provide for sufficient fuel supply—

Sections so arranged as to prevent direct draught—

Every inch of fire travel backed by water in the hollow sections, thus using to the greatest possible degree the combustible gases.

Write for catalogue and prices.

We carry in stock for your immediate command every size and style of Cast Iron and Malleable Fittings, Brass and Iron Body Valves, Pipe, Tools and Steam Specialties.

CLUFF BROTHERS

LOMBARD STREET, TORONTO

SELLING AGENTS FOR WARDEN KING & SONS, Limited

PLUMBER & STEAMFITTER OF CANADA

SUBSCRIPTION : ONE DOLLAR PER YEAR. PUBLICATION OFFICE : 10 FRONT STREET EAST, TORONTO

Vol. I. No. 3. (New Series). MONTREAL, TORONTO, WINNIPEG, MAY 1, 1907. Old Series, Vol. XIX. No. 13

REPUTATION AND PROFIT You clinch both, Mr. Dealer, by placing your order for

PLUMBERS' SUPPLIES

with a Reliable, Progressive, Twentieth Century House.

Plumbers' Brass Work, Enamelware, Closets, Bathroom Woodwork, Iron Pipe and Fittings, Lead Pipe, Lead Traps, etc., etc.

PROMPT DELIVERIES A SPECIALTY

SOMERVILLE, LIMITED, 59 Richmond St. E. TORONTO

The Merit of Standard Ideal Porcelain Enameled Ware

Porcelain Enameled Lavatory Cast in One Piece

is recognized by the Plumbing and Hardware trade. Standard **Ideal** Ware is of one-piece construction, durable in character and of designs calculated to meet the requirements of the Canadian markets.

Standard Ideal Lines

We manufacture Bath Tubs, Sitz Baths, Shower Baths, Lavatories, Urinal Ranges, Slop Hoppers, Laundry Tubs, Sinks, Closet Ranges, Steamship Supplies, Railway Car Supplies, Hospital Appliances

Porcelain Enameled Sectional Lavatories

The Standard Ideal Company LIMITED

Head Offices and Factories: PORT HOPE, ONT.

SALES OFFICES AND SAMPLE ROOMS:

TORONTO
50 Colborne Street

MONTREAL
128 West Craig Street

WINNIPEG
24 Telfer Block

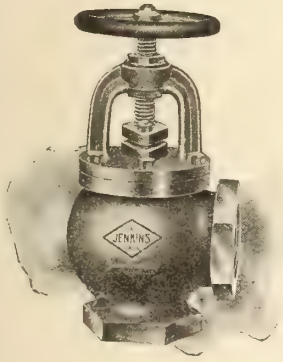
Plumbers' and Steamfitters' Supplies

Quotations
Cheerfully
Furnished

A Full Line
always
on hand

SOMERVILLE LIMITED

59 RICHMOND STREET EAST - TORONTO



Catalogue and discount sheet sent on application.

JENKINS BROS.

35 High Street, Boston, Mass.

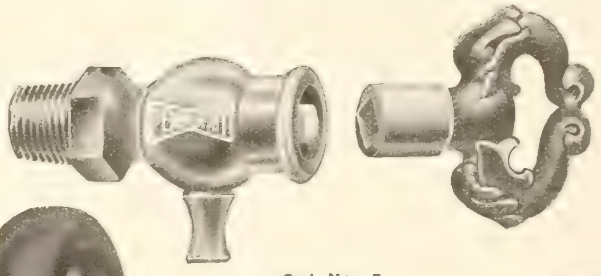
New York Philadelphia Chicago London, E. C.

PENBERTHY

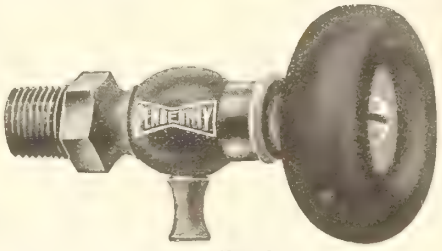
TRADE PENBERTHY MARK.

We Make a Vent That Can Look a Plumber Straight in the Eye

If it's **quality** you want, it's **Penberthy** you want.



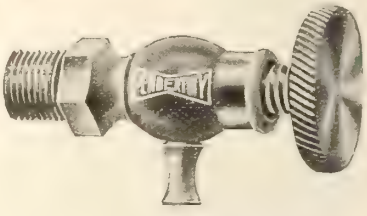
If it's **Penberthy** you get, its **quality** you get.



Cut No. 3
Nickel-plated with Wood Wheel

Cut No. 5
Nickel-plated with Key

THE BEST METAL
THE BEST FINISH
THE BEST WEIGHT
and always
THE BEST GOODS



Cut No. 4
Nickel-plated with Metal Wheel

PENBERTHY INJECTOR CO., Limited, WINDSOR, ONT.

"Standard" Plate P 1245, Porcelain Enameled Sink, with Apron all around, Enameled Sink Legs with Wall Supports, Nickel-plated Strainer, Fuller Adjustable Flange Bibbs and "P" Trap with Waste and Vent to Wall.

Houseowners Know What

"Standard"

Stands For

In the public mind **"Standard"** and Sanitation are synonymous terms. Whenever you specify **"Standard"** Porcelain Enameled Fixtures for Residence, Hotel or Apartment House, you are assuring the owner that he will receive what he recognises as the best in the way of sanitary equipment.

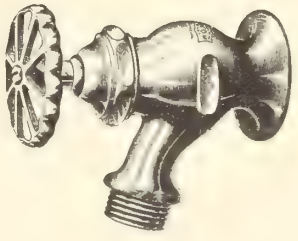
Standard Sanitary Mfg. Co.
PITTSBURGH, PA.
U. S. A.

Babbitt, Solder, Lead Pipe, Etc.

The
Canada Metal Co.
Limited
TORONTO

Mueller Compression Sill Cocks

Body threads engage all the stem threads during compression. Stem will not chatter or work loose on account of premature wear of top threads. Tee or wheel handle or loose key, straight or bent nose.



THE MARK OF UNCONDITIONAL DECATUR HOM ILL. U.S.A. REGISTERED TRADE MARK GUARANTEE MUELLER GOODS

H. MUELLER MFG. CO.

Decatur, Ill., U.S.A. *New York, N.Y., U.S.A.*

Advance of Practical Sanitary Science

ARTICLE II.

Written for this paper by W. Holley, Associate Royal Sanitary Institute.

Following on the "Washout" pattern came the "Washdown." This was first named "hopper with trap," and would seem to have been evolved from the thought "why not have the soil deposited directly into the water in the trap

Fig. I

and so do away with the shallow receptacle which is the principal feature of the "Washout?" The idea in practice was found to work very satisfactorily, and it soon became much used and grew in popular favor. It is now on the market in very slightly varied forms and all demonstrate very clearly the return from the complex mechanism of previous fixtures to simple construction, but a simplicity based on a proper scientific basis.

In this pattern there is nothing whatever to impede the flush, or destroy its power, there are no working parts, and the shape of the bowl, both internally and externally, is such as to be very easily cleansed, as well as to accumulate a minimum of filth. The fact of it being made entirely of porcelain or earthenware, as also in the case of most forms of "Washout," is a step in advance.

Regarding the flush it has been found to be the most sanitary pattern in use in places where the waterflush is limited, and one form of this pattern is the standard demanded at the present time by the London County Council (England), within their area where the flush is so very small.

Good and Bad Closets.

Fig. 1 illustrates a good form, but, of course, there are some very poor models put upon the market, and in deciding on their respective merits as sanitary fixtures there are several important points to be considered.

Fig. J. shows a form which is very poor and unsanitary, the water area in this instance being far too small. This allows the interior surface of the bowl to become fouled at B., which in a short time the flush is not capable of cleansing, so resulting in a unsanitary. The depth of the seal is also very small, far too small to be considered a safeguard against syphonage. The positions in which this bowl could be safely used are very limited; so few, in fact, that one is justified in condemning them entirely.

Prohibited in Montreal.

The Health Committee of the City of Montreal within recent date have recognized this fact and prohibited the use and installation within the city limits of a bowl of this form, which was being sold throughout Canada, unless the person who installs such can prove to the satisfaction of the committee that they are non-syphonable under certain conditions. This is virtually condemning the bowl, for no person can prove that they will answer the requirements of the city authorities as a sanitary closet bowl.

The question of break syphon is one regarding which very little unanimity of

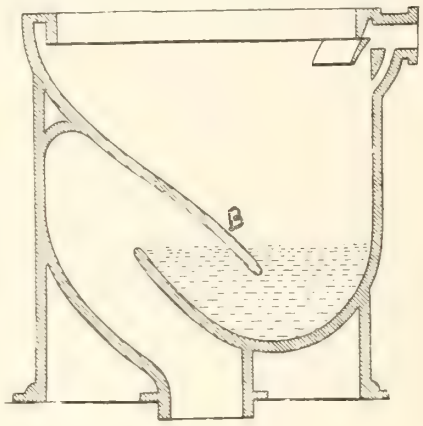


Fig. J

opinion prevails at the present time, but it will be readily observed that it is very largely influenced by, and dependant upon, the class and form of fixture to be used, particularly regarding water closets. Whatever may be the attitude of the authorities of a city in which such a bowl is being installed, it is only possible to make a sanitary job by the use of a large trap vent.

Many bowls are in use throughout the country with a depth of seal only 1½ inches without vent, whereas the minimum should not be less than 3½ inches. The best types are now made with a depth of seal of 4½ or five inches, and even with this depth sanitarians are not agreed as to the non-requirement of a vent.

Another very important point to be observed regarding this pattern is the size of the outlet, from the bowl to the back portion of the trap at A. (Fig. 1.) This should be slightly less in diameter than at any other part of trap or outlet from closet. If anything, therefore, can be carried past this point, by the flush, it is almost impossible to block, and if the contents can not be carried through this opening, the trouble is within easy reach of the plumber to remedy.

Many of the cheaper types are found to be less in diameter at B. (Fig. 1), and consequently very many block at this place. This is probably due to faulty construction, or to contraction during the firing process, but bowls should only be installed which have a uniform diameter through the trap and neck after leaving the outlet from the hopper. These are important considerations where the best work is wanted, and should be given due consideration by the party responsible for any job.

Practical Improvements.

Some of the models of this bowl have lately been improved by the addition of a jet, a channel through which a portion of the flush flows down the interior of the back of the bowl and enters the bowl at the bottom of the hopper. This is a good idea and helps largely in forcing the contents of the bowl into the soil pipe. (Fig. K. illustrates a good form.) These models vary in detail of construction, but in the writer's opinion the idea is an excellent addition to this pattern of bowl. A deeper water seal can be made when being manufactured, and the bowl should work more effectively with this addition than without, and so at once its advantages will be obvious.

Of course, it would be unwise to use this model in places where the flush is limited to about two gallons, say; for the interior surface of the earthenware could not be cleansed with a less amount flowing over at each operation, and with this type a large portion of the flush

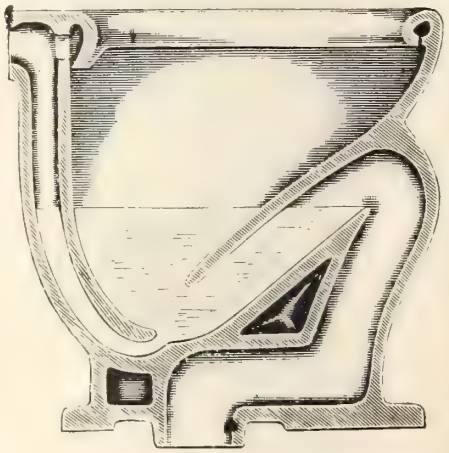


Fig. K

does not flow over the surface, but enters the bowl from the bottom. Where there is a fair supply of water available this addition is a good one, since the bowl will work with a much deeper seal and consequently less danger of syphonage.

Let us now notice that masterpiece of bowl construction, "the syphon jet" or "twin jet" Fig. L.). These bowls are much more difficult to make than any of the previous mentioned earthenware patterns and, consequently, more expensive, but at the same time give a much more massive appearance.

Bowl Emptied by Suction.

The principle of operation is that syphonic action is set up by the flush and the contents of the bowl sucked out into the soil pipe. This is accomplished by a large portion of the inrushing fresh water flowing down the side arms and being forced upwards into the bowl, directed straight for the outlet of the bowl, as at "A." This starts syphonage and most effectively empties the bowl by suction. After the syphonic action is broken by the water seal being absorbed and the air rushing in to fill up the vacuum, the arms contain sufficient water to properly refill the trap, thus assuring a full seal after each operation.

The whole action is very positive and such a copious flush is very powerful. While the action is in operation part of the flush enters the bowl through the

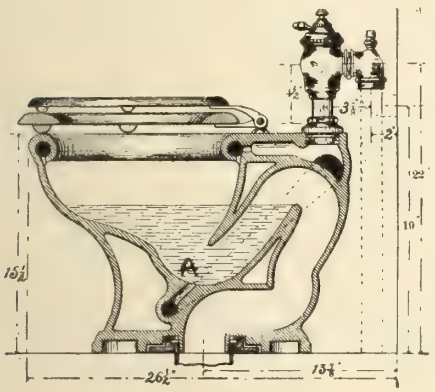


Fig. L

flushing rim, thus properly cleansing the whole interior surface.

This pattern is designed especially to prevent the seal being broken by syphonage, due to suction in the pipes, and yet to dispense with a trap vent. In this it is largely successful, for it is only under the most exceptional conditions that the seal of a good type is ever broken. They, however, require a much larger quantity of water, which is a marked disadvantage in places where water is limited or sewers too small.

It is also necessary, to obtain the best success, that the water should be delivered to the bowl in as short a time as possible; in other words, the flush pipe should be larger than is required for the other types, for the quicker the water passes into the bowl the more positive will its action be. This is an important consideration when being installed in connection with an ordinary supply tank in the ceiling of a building.

Another good point is the large water area, which is a special feature of good form. There are some which fail somewhat on this point, but most all have good-sized areas. This contributes some to the continued cleanliness of the fixture and should be noticed by the person called upon to select.

One other feature which needs mentioning is that it is not intended that this bowl should be used for the reception of large quantities of slops, and there is a danger of the bowl being unsealed when being so used. Pouring large quantities of liquid into the bowl sets up the syphonic action which removes all the contents into the soil pipe, the seal being broken, and remains so unless the proper flush is operated. Part of the design of the fixture is that the bowl shall be resealed by the water contained in the arms, and when used otherwise there is this danger of an unsealed trap being left so, which is worthy of note.

Very similar results from a sanitary standpoint are obtained by the use of this pattern of fixture as from the best washdown pattern fitted with trap vent and using three or four gallons of water. Both are clean and positive in their operation, and only in most exceptional circumstances have the seals been broken.

The syphon jet, however, requires from six to ten gallons of water, and so it is a question which is preferable—the use of this large amount or the providing of an adequate trap vent.

This is really one of the large questions outside the range of these articles, but one of great importance within the consideration of our health authorities.

(To be continued.)

SEWAGE AND DISEASE.

Epidemics of typhoid fever have increased alarmingly and can in nearly all cases be traced directly to the contamination of either food or water with typhoid germs, and these germs always come from a typhoid patient and are not due, as commonly supposed, to decomposing animal and vegetable matter or stagnant water. Many of the large cities in America secure their water supply from rivers or streams which receive sewerage from towns located above the source of supply. This sewerage of course carries typhoid germs into the stream, and these germs are not destroyed until they reach the water supply of the cities.

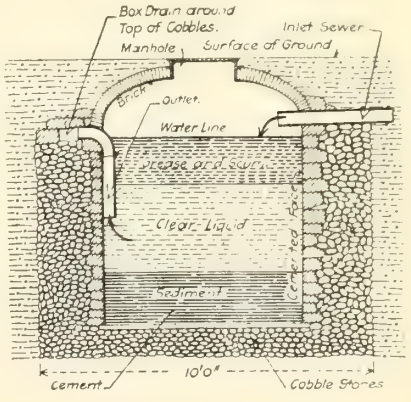
The problem of securing pure water for large cities is one which is attracting the attention of the health departments everywhere. It is surprising that the medical authorities have not pointed out the dangers, to say nothing of the disgusting part, of using sewage—contaminated water for drinking purposes. It is safe to say that it will only be a few years until all this will be changed. Drinking water for our cities will be obtained from mountain lakes or from driven wells.

Milk is another source of danger, particularly where the pails are rinsed out with typhoid-contaminated water. Milk is a splendid medium for the growth of the typhoid bacillus and there are on record quite a number of cases where epidemics of this disease can be traced directly to the milk supply, received from a dairyman who had a typhoid patient. Water from the well was used for rinsing the pails. An investigation proved that rats had opened up communication between the well and the water closet. The discovery was made by dumping salt into the water closet. In a short time the well water became so salt as to be unfit for use, and examination of the water proved that contamination came as described.

Several epidemics of typhoid have been traced to contaminated oysters. Oysters grow best in salt water. In fresh water they become sick. In some of the eastern harbors the oysters are brought into water almost fresh for fattening purposes. Sewage from rivers empties into these harbors and the oysters sometimes become contaminated with typhoid. These germs live for a long time in the oyster, even multiplying.

SEPTIC TANK CONSTRUCTION.

The cesspool does not furnish, as commonly constructed, an ideal method of sewage disposal, but is bound to be largely used to dispose of wastes from private houses in the country and small villages, says the Engineering Record. From the landlord's point of view, its greatest objection is its liability to clog and become water-tight. This may take place in a very short time in tight soils,



A Septic Tank Cess Pool

or in fine sand. The bottom soon becomes choked with sediment and grease, and the water line rises, thus bringing fresh surfaces around the sides in use. These gradually clog with floating soap and grease, forcing the water line higher and higher, until the pool is full and almost water-tight, when the only remedy is the building of a new one.

The sketch shows a septic tank and leaching pool in one construction. The aim of the design is to arrest the sediment and scum, and bring only comparatively clear liquid in contact with the absorbing surfaces, thereby prolonging the life and usefulness of the cesspool indefinitely. By proportioning the tight inner chamber, so as to have a capacity for about 36 hours' output, septic action may take place without putrefaction and the attending odor and gases. The construction, as shown in the sketch, does not entail any large additional first cost, and will, no doubt, in most cases furnish permanent disposal. The design has been made by Fred K. Betts, assistant engineer of the Department of Water Supply of New York City, who has charge of the Sanitary Patrol of the Croton Watershed.

PLUMBER AND STEAMFITTER OF CANADA

The MacLean Publishing Co.
Limited

JOHN BAYNE MacLEAN - - - President
W. L. EDMONDS - - - - Vice-President
H. T. HUNTER - - Business Manager
WESTON WRIGLEY - - - Managing Editor

ASSOCIATE EDITORS:
M. J. QUINN S.H. and V. Engineer - Toronto
C. E. OLDACRE, M.A.S.H. and V.E. - Toronto
W. HOLLEY Associate Royal Sanitary Institute - - - - - Montreal
W. B. MacKAY - - - - - Toronto
F. R. MUNRO - - Winnipeg, Man.
G. S. B. Perry - - - Vancouver, B.C.
W. E. HOPPER - - - St. John, N.B.
JAMES HICKEY - - - Halifax N.S.

Publishers of Trade Newspapers which circulate in the Provinces of British Columbia Alberta, Saskatchewan, Manitoba Ontario, Quebec Nova Scotia New Brunswick, P. E. Island and Newfoundland

OFFICES
MONTREAL - - - - - 232 McGill Street
Telephone Main 1525
TORONTO - - - - - 10 Front Street East
Telephones Main 2701 and 2702
WINNIPEG - - - 511 Union Bank Building
Telephone 3726
LONDON, ENG. - - - - 88 Fleet Street, E.C.
J. Meredith McKim
Telephone, Central 12960

BRANCHES
CHICAGO, ILL. - - - - 1001 Teutonic Bldg.
J. Roland Kay
PARIS, FRANCE - Agence Havas, 8 Place de la Bourse
MANCHESTER, ENG. - - 92 Market Street
ZURICH, SWITZERLAND - - - Louis Wolf
Orell Fussli & Co.

Subscription, Canada and United States, $1 00
Published Twice Every Month
Cable Address { Adscript, London
Adscript, Canada

CALL A CONVENTION.

Existing conditions call for a prompt reorganization of the Master Plumbers' Association of Ontario. The feeling in all parts of the province is strongly in favor of the holding of a convention this spring and it's up to someone to issue a call for such a gathering. Ben Noble, of London, as Ontario vice-president of the National M.P.A., is the man at present responsible and the editor of the "Plumber and Steamfitter" has written him urging that he issue a call for the suggested convention. W. J. Walsh, of Hamilton, as president of the old association, and Harry Mahoney, of Guelph, as national treasurer, might co-operate with Mr. Noble in making the necessary arrangements.

In the work of re-organization it will be necessary to draft a plan of organization which will be entirely within the law, the association having plenty of scope for work in developing a more friendly feeling amongst the trade and in discussing trade subjects regarding which much education is still required. The old association was carrying on a splendid work in improving the sanitary conditions of the province as well as in endeavoring to secure uniform plumbing by-laws in all the cities throughout Ontario. In this connection the following resolutions adopted by the recent convention of the Michigan Master Plumbers' Association will be of interest;

"Whereas, local associations are at times tempted to formulate price agreements; and, whereas, such conditions are sure, sooner or later, to call forth the censure of the press, and thereby bring our Master Plumbers' Association into ill repute with the public; therefore, be it resolved: That it is the sense of this convention that price agreements and similar arrangements on the part of members and locals are wrong, unlawful and in violation of the statutes of the state and nation; and be it further resolved: That we condemn any such action, and that the state association always has been and is opposed to and will refuse to in any way be a party to or recognize any such agreements."

With labor troubles forcing the masters in Toronto, Hamilton, London and other places to get together locally the present is an opportune time for a provincial convention to be called. Let the suggestion receive the serious consideration of the officials responsible. The "Plumber and Steamfitter" is at the service of the trade in making any announcements which may be considered necessary.

LABOR TROUBLES.

The labor situation at Toronto looks very serious and present indications point to a prolonged period of inactivity. Nothing definite can be announced, of course, until after May 15, but the employers are determined not only not to grant the increased wage demands of the journeymen, but also to establish the open shop in future. They are fully prepared for a twelve months' fight if necessary and as prices have been cut badly for the past year or so, the bosses figure that they will be able to earn journeymen's wages (more than some bosses say they have been getting) by doing jobbing work during the continuance of the strike.

A prolonged strike may be helpful to the trade in other ways. Work will get behind and builders may be willing to pay more reasonable prices on plumbing and heating contracts. And with plenty of work in sight the masters may be able to adopt a firmer attitude and refuse to accept contracts for radiation at from fifteen cents to eighteen cents per foot and for bath room outfits at as low as $130 to $140, prices which have been ruling lately. In association days a couple of years ago, $180 was the standard price for a bath room job and at that the master plumber did not make more than 25 per cent. profit, while grocers, hardwaremen, booksellers and other tradesmen frequently make as much as one hundred per cent. on similar staples handled by them.

In Omaha, where a lock-out of journeymen plumbers recently took place, an agreement was reached under which the bosses grant an advances of wages and in return the men agree to the open shop principle.

SCHOOL FOR PLUMBERS.

About as far back at 1887, the Master Plumbers' Association of Montreal, opened a trade school for apprentices, and for two years supplied practical instructors from members of the association.

The Government then took charge of the school and appointed two teachers, one master plumber and one journeyman plumber.

The school has grown in favor, and the number of pupils increased yearly, till at the present time there are one hundred and thirty-three in the class, and a staff of three competent instructors.

The class meets above the St. Lawrence Market, Montreal, on Tuesday and Friday evenings. The school is absolutely free and is only for bona fide apprentices working for master plumbers in the city of Montreal. Instruction is given on lead bossing, lead pipe bending, wiping joints, soldering joints and seams with soldering iron, the proper use of tools, methods of fitting up water closets, baths, lavatories, sinks, etc., proper traps, soil, drain and sewer pipes, proper sizes of pipes for water and drain work, etc., drawings of work with explanations, and in fact every class of work a plumber is called upon to do. Theoretical lessons are shown on the blackboard, and questions are put to the pupils which they must answer verbally to the teacher.

All material to carry on the work is supplied free to the pupils by The Council of Arts and Manufactures.

The Master Plumbers' Association took great interest in the class last year and presented some very fine prizes to the successful pupils, and have notified the secretary of their intention to repeat the act this year.

The only complaint is that the school is not large enough, and this term many hopeful apprentices had to be refused admission for lack of room.

At the general exhibition of The Council of Arts and Manufacturers, to be held in the Monument National, Montreal, this June, the public will have the opportunity of viewing the work, not only of the Montreal class, but of the branches all over the Province of Quebec as well.

SURFACE SOIL RESERVOIRS.

In connection with the plans of the new Catskill reservoirs by the New York Board of Water Supply, the question arose as to whether it would be advisable to strip the surface of the ground which will form the bed of the big Ashokan reservoir of all vegetation and surface soil, with a view to securing a better quality of water. The practice of stripping is advocated by the hydraulic engineers of Massachusetts, and the most notable instance of carrying out this costly method of securing pure water is to be found at the Watchusets reservoir, which impounds over 60 billion gallons of water and forms the main source of the Boston water supply. The new Ashokan reservoir will have a capacity of 140 billion gallons; and the New York Board of Water Supply, having in view the great expenditure which would be necessary to strip the bed of the reservoir, referred the whole question to a board of two engineers, who, according to the Scientific American, have lately presented an exhaustive report, in which it is shown that while there are undoubted advantages in the practice of stripping, a more effective method of purification is to be found in the construction of filtration plants, through which all the water must pass in its course from the reservoirs to the city's faucets. Moreover, in spite of the most careful safeguards, it has proved to be impossible to absolutely prevent infection of the watersheds from which reservoirs are filled, and it has come to be recognized that the only effective way to attack the problem is by interposing a filtration plant between the open-air reservoirs and the city to be served, which will not only remove all bacteriological impurities, but also those which are due to submerged and decaying vegetation.

KEEP TRACK OF COSTS.

Because the total cash balance or the total net assets of a concern are greater at the end of one year than they were at the end of the year preceding is no assurance that the business has been conducted in the best possible manner. In the plumbing business, for example, contract work is done again and again at a loss, and is carried successfully only because of the help of the jobbing work.

Those who have adopted some rational system of watching the outgo as well as the income have found how much of a particular sort of work they could handle, or at what figures it could be undertaken. An exchange tells how the steamfitting fraternity in a large American city failed to show satisfactory returns during the past two years—a time when they should, if ever, have been abundantly successful, and points out that no other proof is needed to show that business bookkeeping is conducted none too well.

Estimates for promised work seem ordinarily to be carefully made, but there is always some kind of a lapse with regard to the proper charging of time and material, and profits from a given contract are credited too highly, and the shortcomings are not discovered in time to affect later estimates.

When the negative condition of business is exhibited among a large number in the same community there is evidence that the savage competition existing is due to some one serious fault, and it does not seem that practically everybody for a long series of months should have a mania for contract getting, regardless of the profit on the work done.

VALUE OF A FIRM'S NAME.

Recent business changes in Regina, Sask., raise a question as to the value of a well-established and widely known firm name. Last fall the big hardware store of the Western Hardware Co., Regina, was totally destroyed by fire. In December the business of the Smith & Fergusson Co. was sold to Peart Bros., the former proprietors of the Western Hardware Co. As a result two widely known firms—the Smith & Fergusson Co. and the Western Hardware Co.—have disappeared from the hardware trade entirely. Mr. Smith is continuing his coal business under the old name of the Smith & Fergusson Co., but his new wholesale hardware business is to be incorporated as the J. W. Smith Hardware Co.

These changes raise the question of the value of firm names. The Smith & Fergusson Co., and the Western Hardware Co., were widely and favorably known. Did not Mr. Smith and Peart Bros. sacrifice valuable assets when in the course of a few business changes they dropped the old firm names ?

FIRE PREVENTIVE MEASURES.

In a paper recently read before the Toronto Insurance Institute, Paul von Szeliski, of the insurance firm of Szeliski & McLean, Toronto, discussed the great fire waste of this continent resulting from conflagrations and general causes, and arising partly from lack of adequate fire protection, municipal as well as private, and partly from poor building construction. Proper care, supervision and foresight, so largely exercised both by individual citizens, and municipal authorities of European countries in matters of fire protection and prevention, must be lacking in Canada and the United States, judging from the number of fires. Not only can few buildings be erected in a manner to make them susceptible of only a minimum of damage from fire, but also old buildings of faulty construction can be improved in many ways, and in return therefor a considerable rate reduction be obtained from the fire insurance companies.

"Fire walls," ("cut-offs," or brick division walls extending through roof) can be introduced to make floor areas as small as the demands of your business will permit ; large areas are the principal cause of conflagration. Openings between floors and between rooms should be limited to those absolutely required which should be protected by automatically closing doors or traps to prevent the spreading of fires ; openings toward "exposing" buildings can be protected either by shutters, wire glass windows or open sprinklers ; fire buckets and standpipes can be provided with which to extinguish a fire before it can assume large proportions. However, the best device for protection against interior fires, and which has reduced losses phenomenally, consists in automatic sprinklers, a system of pipes, variously supplied with water under pressure, generally suspended from the ceiling, and provided every 8 to 10 feet with "sprinkler heads." These heads open automatically by the heat of any incipient fires, and by the water immediately rushing from the opening, the flames are extinguished or at least kept in check. Watchmen's portable or electric clocks, as also central station control and alarm systems are coming into more general use.

All such improvements and devices merit allowances in the fire insurance rate and the reductions of rate thus secured are dividends on the money spent for their introduction. To some of our readers these suggestions as to building construction will, no doubt, prove of value. They will be followed up at a later date by hints by the same writer on the arrangement and safeguarding of hazards and the warehousing of merchandise by the assured so as to merit reduced fire insurance rates.

All fixtures and property of the house should be treated with the greatest care; the first scratch paves the way for carelessness.

Advantages of Hot Water Over Steam

C. E. Oldacre, Toronto, Continues the Discussion on the Application of These Two Systems of Heating Private Residences.

In general we understand by heating, the raising of the temperature of the air in a room or rooms up to a determined point and the maintenance of this temperature during a desired period of time, which only can be accomplished when the room is supplied with an amount of heat equal to the heat lost through the surrounding surfaces.

The heat loss may occur either by the cooling of the air from the walls, ceilings, windows and doors in contact with air at a lower temperature, or a leakage of air from the room through such walls, ceilings, windows and doors.

Many methods of heating are afforded to-day, which have application according to circumstances and conditions. Buildings or rooms may be heated by stoves, hot-air, steam, hot water or electricity. The source of heating may be coal, woad, oil or gas, and through these, with the several systems of heating, we have many modifications and combinations presenting a multiplicity of methods. No one of these methods can be said to be the best for all purposes, but each has its own adaptation.

Requirements of Heating Systems.

There are certain requirements that all heating should meet. These requirements are :

1.—The heated rooms shall be evenly warmed in all parts, without causing any appreciable drafts.

2.—It shall not impair the quality of the air of the room.

3.—It must be easily modified and adaptable to a wide range of outside temperature.

4.—It shall insure economy in operation and maintenance.

5.—It must afford the greatest bodily comfort.

There is no method of heating known to-day, that so well meets all these requirements, and is so well adapted to the heating of private residences, as the hot water system of heating, and when all these points are taken into consideration it is in every way superior to steam heating.

Thorough Test of Hot Water.

In its operation there is given off an even, mild heat from the radiators, producing a steady, equable temperature in all parts of the room. Some few years since this was given quite a thorough test by a German professor, Professor Esmarch. (See "Die Zentralheizung," by Hugo Freiherrn von Seiler, Vienna, 1903.)

He arranged ten thermometers about a room that was heated with hot water, having the radiator placed under the window-sill. The thermometers were graded for reading variations of ¼-degree. One was placed at the bottom of the radiator, three directly over these, four close about the window and the others at different parts of the room. Numerous readings were taken at different times of the day, during both still and windy weather, and he found that under all conditions the temperatures were practically the same at all points and that even when the wind was against the window there was not a perceptible movement of air more than three feet from the window.

The air movement was tested with smoke and it here showed only a slight movement of warm air. These results he attributed to the location and the mild heating of the radiator.

Less Effect on Relative Humidity.

The surfaces of hot water radiators approaching more nearly to the temperature of the air of the room than do steam radiators, have less effect on the relative humidity of the air, so there is less effect on the condition of the air of the room. Also it is to be noted that on account of the lower temperature of the radiating surfaces in hot water, that the infinitesimal particles of dust, that are ever present in the air, are not subjected to a burning or scorching, which has the effect of giving an odor of "burnt air," owing to which we so often hear persons speak of the soft, mild heat of hot water.

Eminent authorities, to whose notice these matters have been brought, have found cases where the relative humidity was quite high and yet there was a feeling of dryness from this very cause. We can see, from this, that where rooms are to be heated and continuously occupied as in private residences, hot water heating offers advantages, and is more sanitary than steam, or any other form of heating we have to-day.

Simplicity and Variability.

Hot water heating may be operated at any temperature, slightly above the temperature of the air of the heated room, up to 190 or 200 degrees Fahrenheit, thus giving a very wide range adaptable to all kinds of climatic conditions or variations. This all may be accomplished without complicated mechanism or undue attention, simply by varying the amount of fire, which will affect all the radiators that may be connected with the heater, or by the throttling of the valve attached to each radiator. The amount of heat given off by any certain amount of heating surface being closely related to the temperature of these surfaces, this, of course, is not possible with steam heating as we know it at present.

In other words, with hot water we have a difference between 100 and 200 degrees, or 100 points, and with low pressure steam we have only a difference between 213 and 228 degrees, or 15 points, for varying the temperature of the heating surfaces.

It being necessary to place the full amount of radiation in any given room that may be required to meet the coldest weather prevailing in any particular section, it can readily be seen how easily a room may be overheated with steam in moderate weather, and how easily this overheating may be avoided with hot water.

Hot water heating excels steam, as well as all other methods of heating, in its economy in operation as also in maintenance—less fuel cost and practically no repairs.

Continuous, even heating, which is so desirable, is attained with hot water heating, but it is hardly possible with steam. Any one who has had experience with low pressure steam heating in residences knows how uneven it is in the temperature it gives, for with steam it is necessary to have the water boiling before there can be any steam in the radiators, and as soon as the fire is lower than that required to boil the water there is no heat in the radiators, no matter how much fuel may be burned, and practically all the fuel burned during such times is wasted, and this waste may go on for hours.

Hot water, unlike steam, ensures a comfortable house with little or no attention all night and plenty of heat early in the morning.

Hot Water's Steady Temperature.

It is at night-time that we have the lowest temperatures, and it is then also, when the steam goes down, that the cold is most felt. In fact, the walls become further chilled and require an extra amount of fuel to again bring up the temperature. It can safely be said if as steady and even a temperature was kept up continuously with steam that it would require vastly more fuel than does hot water.

During moderate weather hot water shows its great economy, as a very small fire is all that is required to keep up the necessary heat. Whereas, with steam it would be necessary to get up a sufficient fire to boil the water practically the same as in cold weather, in order to heat the radiators, and as this would make the rooms too warm if kept up continuously, it will be necessary to let them cool again, and so on, giving very fluctuating temperatures.

Opinions of Eminent Men.

Prof. H. Reitschel, in his "Leitfaden zum Berechnen und Entwerfen von Luftungs-und Heizubgs-Anlagen," Berlin, 1902, says : "Hot water heating permits of a general regulation of the amount of heat from the various radiators located in the rooms, merely through the amount of firing, as the water can be kept within any desired limit of temperatures—an advantage no other heating system can show to the same extent."

Prof. R. C. Carpenter, (Professor Experimental Mechanics, Cornell University), states in "Heating and Ventilating Buildings" : "The tests which have been made have generally shown somewhat in favor of hot water. * * * The heat from hot water is somewhat less in intensity and more pleasant than from steam radiators and the temperature can be regulated simply by the throttling of the supply pipe of the radiator, which is not the case with steam." He cites the transactions of the American Society of Mechanical Engineers, Vol. X., also the reports of the Massachusetts Experimental Station, No. 8, 1890.

Walter Jones, Stourbridge, England,

M.I.M.E., and M.I.H.V.E., one of the best authorities on hot water heating, says, in his treatise, "Heating by Hot Water": "Any work that can possibly be done with a circulating boiler, either for warming buildings or supplying hot water, the fuel consumption will be from 30 to 60 per cent. less than if done from a steam boiler." He enumerates many experiences covering these points and cites many illustrations. Further, he states: "Now, I say, unhesitatingly, there is no system (hot water) that has greater advantages, or fewer disadvantages. * * * An even, equable, and humid temperature can be maintained, the heat distributed, regulated, and controlled with better effect, and with less fuel."

Richard Swalwell, Winnipeg, in the Metal Worker, (N.Y.), of March 23, 1889, says: "After an experience of many years in the planning and fitting up of heating apparatus, the writer is of the opinion that hot water is the best known medium for heating buildings, whether large or small." And all experiences have exemplified and sustained in every way this statement made eighteen years ago.

The Arguments Summed Up.

In short, it may be said that the advantages as detailed above of hot water heating over steam heating for residences are:—

It is cheaper in operation, it is cheaper in maintenance, it is noiseless, it is more sanitary, it is more even, it is more comfortable, it is easier in management, it is better suited to varying temperatures, it is better adapted to different times of the year when heat is required, it makes a house freer of drafts, it is more conducive to health, comfort and vigor, it requires less attention, and it gives greater satisfaction and less trouble in every way.

INTERESTING CORRESPONDENCE.

A Hamilton correspondent writes: "In your issue of April 17th, 1907, many valuable points regarding the many advantages of hot water heating over steam are well and succinctly brought out by the various writers. Though the writers have, of necessity, had experiences differing from each other, and though located at widely distant points, the self-same conclusions have been the result. More of such articles along the same or similar line should bring out many interesting ideas that would be of good use to all in the field covered by The Plumber and Steamfitter.

"I have read these articles with the greatest of interest, and, from my view, all agree that hot water heating is the method of heating to be preferred for the heating of private residences—and this, I believe, was the strict line of the text—and when steam has been given a preference it has been spoken of in other fields than that of residence heating. Steam, undoubtedly, as a heating medium, has great and important missions to fulfil—and fulfils such better than hot water.

"I note you invite discussion of these matters and take the liberty to speak of some points brought out and if, in further discussions other points are brought out, it will be in line with the intent of these remarks and in accordance with the spirit in which they are made.

Different Writers' Conclusions.

"All the writers have noted the greater possible variation in the amount of heat given off by hot water radiators than by steam, and the impossibility of not over-heating with steam in mild weather. The writer from Winnipeg boils this matter down in few words and states the case clear and well.

"Is it not true that when the question is asked if readers can agree with Mr. Desmarchais about explosions with hot water, that his remarks have been misread or misunderstood? He speaks of the bursting of pipes or radiators from freezing or other causes. I do not think he means explosions, but rather leaks from mismanagement and from defective material accidentally creeping in—such as sand-holes in fittings, split fittings or split pipe. The latter can hardly occur in a completely finished job, and if they do are at once corrected before the work is left, and as for mismanagement, that can't be prevented with the most concise and explicit instructions in the world. A fool-proof article in no line has ever been got up and probably never will. There's nothing to prevent a person in examining a gun from pointing it at himself and blowing his brains out—but that is not the fault of the gun or its quality.

"As for the point brought out by 'G. S.', regarding repairs to steam plants, caused by pounding of air in pipes—is this not a little far fetched, as such does not occur in properly laid pipes and reasonably well operated steam plants? Such faults are the result of poor design or poor workmanship. Hot water has enough advantages, forcibly and clearly presented by 'G. S.', without throwing up to poor steam such defects. That valuable feature of hot water—the ease and certainty of increasing and decreasing the temperature with hot water—is well put forth and shows undoubtedly that 'G. S.' has had a wide experience with both steam and water as a heating medium.

An Evident Misunderstanding.

"There is one point in his letter that looks somewhat like a mis-statement or that the words do not convey just the idea intended to be conveyed, when he says: . . . it is not necessary to have the water heated to more than 165 degrees. Thus, it will be noticed, you cannot heat the air more than that.' Air, in a house or building, could not be heated to 165 degrees with the water at this temperature, and in passing over surfaces at a temperature of 165 degrees Fahr. is not raised to any such temperature—nearer 90 to 100 degrees would be more correct, and this taken before the air is mixed with the air of the room. Also, 180 is generally accepted as the desired temperature of the water under the usual coldest conditions, though it can safely be run higher under extra severe conditions. A few tests along these lines would be interesting, and I would like to hear of tests that have been made.

"As for the question that is raised regarding the cost of operation of hot water and steam plants, as spoken of in Mr. Desmarchais' letter, I think he is quite right. Tests have shown this to be the case—that is, particularly, if the total amount of heat for the total number of hours is considered together with the obtaining of the desired temperature at all desired times.

"I trust your invitation of the discussion of these and other matters along a friendly line will be well received, and predict that such discussions through the medium of your valuable paper will be productive of many benefits to the trade."

CIRCULATION.

QUESTIONS AND ANSWERS

Readers of The Plumber and Steamfitter are requested to send us short questions which have puzzled them while engaged on any jobs undertaken recently. Probably no class of workmen run across such interesting problems as do plumbers and steamfitters, and certainly no department of a plumbing trade newspaper is more interesting than the "Questions and Answers" pages.

M. J. Quinn, who will have charge of this department, has had a wide experience, having been for many years mechanical superintendent for the Ontario Government, having charge of all heating and plumbing work in the asylums and public buildings of the province, as well as giving expert assistance to the Board of Health in improving the sanitary conditions of the towns and health resorts in the Muskoka and Kawartha Lakes Districts. He is now doing heating and ventilating engineering work for Cluff Bros., Toronto.

Send along the questions or explain the problems which have puzzled you in your work, accompanying the letter with rough sketches wherever possible. The questions will be answered in as plain and intelligent a manner as possible and other readers will undoubtedly benefit as much as the one who sends in the query.

A NEW SUPPLY HOUSE.

The National Plumbing Supply Co., Toronto, has been incorporated, with a capital stock of $40,000, to manufacture and deal in brass, copper, tin and iron goods, enamel and earthernware, soilpipe, plumbers', steamfitters', and engineers' supplies. The provisional directors are: E. A. Rogers, C. H. Ivey, and P. D. Ivey, all of Toronto.

A FEW KINKS FOR PLUMBERS

T. F. McMackin, in Engineering Review.

The accompanying illustrations are presented as an aid to plumbers, and are intended to be used as a ready reference for the man on the job.

Fig. 1 shows the manner of making branch connections, A and B, to the main soil line C. The branch connections, as shown, are supposed to be run from two toilet rooms located on the same floor. These branch connections should discharge separately into the

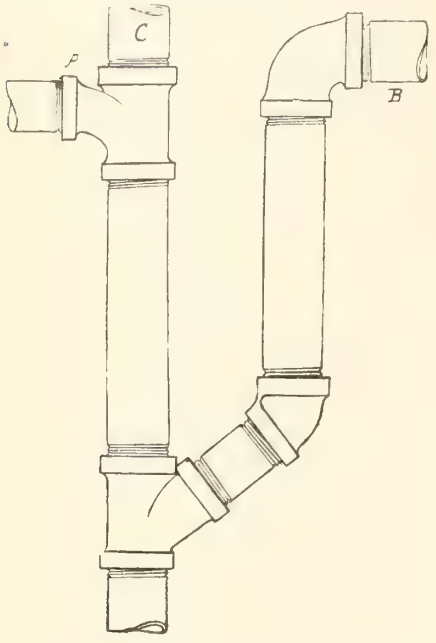


Fig. 1

main stack at some distance from each other. The manner of connecting the soil line with the house sewer is clearly shown in Fig. 2. The connection requires two pieces of pipe of equal length, one of which has two threads and is made up into the sewer outlet. The

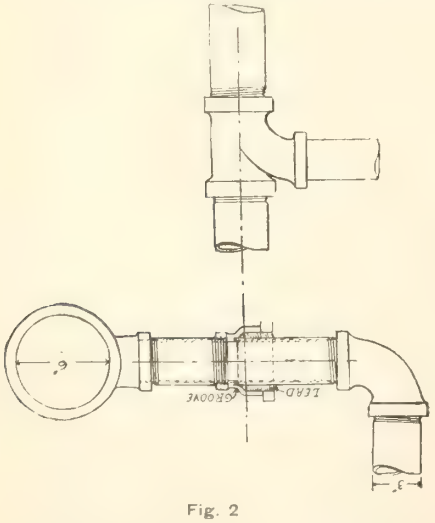


Fig. 2

other pipe contains but one thread. These pipes are connected at the centre by means of a hubbed coupling or insertable joint. This coupling closely resembles a reducing coupling, having a right hand thread at one end and a hub at the other. The fitting is also provided with an extra recess for the pipe to fit in and thus form a perfect bore. It is packed with oil-soaked cotton waste and run in with lead.

To protect woodwork from steam pipes there seems to be an increasing variety of sheet-iron sleeves. Fig. 3 is employed for a single pipe 2½ inches to 4 inches in diameter. It is placed on the pipe before installing and is pushed up until the flange rests against the ceiling. The strips are for the purpose of nailing to the floor or beam. The floor plate can be placed around or on the pipe, as the case may be. Fig. 4 shows the same sleeve made to accommodate a break below the floor.

For electric standards a well-known signal company has a cast-iron stand-

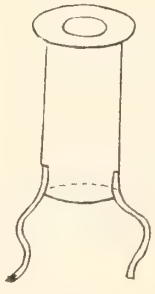


Fig. 3

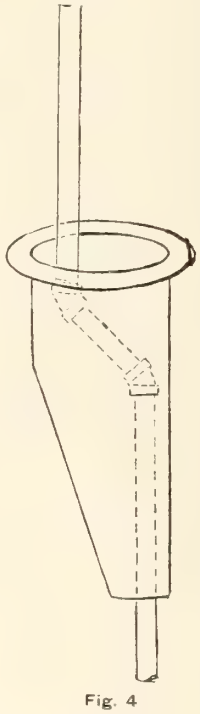


Fig. 4

ard or post which is in two parts, a column and a hubbed base, which is cupola shaped. The column is inserted into the hub on the floor and is made level by placing pieces of board under it. It has a circular cut to fit the pipe column. The inside of the hub is backed up with red clay and the joint is run with a red clay snake and melted sulphur.—Fig. 5.

Fig 6 shows a kink for connecting a water line to the sewer, to be used as a run off from the jacket of an air compressor. There was a tapped hole in the elbow, but directly on top and running alongside were two 5-inch pipe lines. A piece of pipe was bent to fit and a long thread cut on one end and the bushing backed into the elbow and the same made tight by a locknut and lampwick.

Fig. 7 is a hydraulic pipe connection. The flanges are male and female, the thicker one having a hard leather gasket. As there is danger of losing the gaskets they are not inserted until the flanges are faced. The flanges are then pried apart and the gasket inserted or euchred into place by a penknife. This is clearly shown in Fig. 7.

For placing a gasket between two places in a difficult place or when they bind or are uneven (Fig. 8) will be found very useful. Fig. 9 shows another difficult flange connection in an

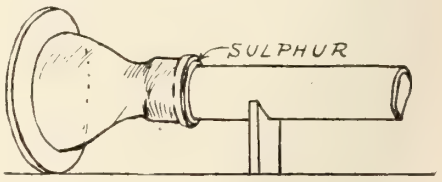


Fig. 5

8-inch line. An 8-inch rainbow gasket wrinkles up so that there is considerable difficulty in entering it into the joint, when the flanges meet. I have tried wiring the gasket to a thin stick, but without result. A good method is to catch it at the side, near the bottom, and to insert one bolt after another, the gasket being drawn tight as it was passed around.

Fig. 10 shows a water meter connection passing through a hole in a 2-

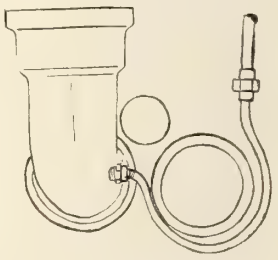


Fig. 6

foot wall underneath the ground. The pipe line is continued 4 inches in diameter up to second elbow and there reduced to 3 inches. The meter is placed upon a shelf, with wrought-iron brackets, and is held to the brick wall by 10 half-inch expansion bolts.

Fig. 11 is a close corner connection and is handled with long sweep, 45 degree elbows. They are connected at the centre by a flange union.

The life of wrought-iron pipe carrying hot water is greatly decreased, as hot water causes rapid pitting of the

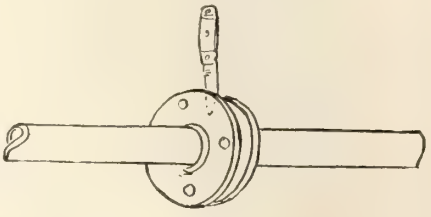


Fig. 7

pipes. Extra heavy galvanized pipe with plain brass fittings should be used. For this reason steamfitters on greenhouse work use cast-iron pipe and fittings in hot water systems. The joints are made with iron borings, red lead

and acid, which form a rust joint. This is packed in with a caulking iron and hammer.

Hot water risers should have all connections to fixtures at each floor made with expansion or hinge joints.

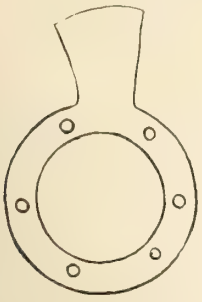


Fig. 8

The cross pipes over the fixtures should be covered by pipe sleeves two sizes larger than the pipe.

The back air connection to closets should continue from the bend half way up the wall, because, in an elbow connection to nipple, dirt is liable to lodge and rust, thus cutting down the diameter of the vent pipe to the closet. With 2-inch lead pipe a long sweeping bend can be made. In urinals, the long leg is used a great deal, it being considered better practice to vent below the trap or to connect the vent right down the waste line, as it increases the efficiency, and, in some cases, permits the installation of an extra urinal. A goose-neck brass fitting is often used. For a steamfitters' connection to boiler, a three-quarter-inch nipple and tee inserted into the sink spud and the faucet replaced is good enough.

Fig. 9

MASTER PLUMBERS AS BUSINESS MEN

Address by Andrew A. Muir before the 15th annual convention of the Michigan State Association of Master Plumbers at Detroit, March 20, 1907.

I believe that you will all agree with me when I say that the plumber is of great importance in the world; yet until recent years he has not been appreciated in his true value, for he hid his light under a basket and kept his importance to himself. Under such circumstances it was no wonder that he was not appreciated at his real worth. We all know that the world measures us largely by our own standards, and as we respect ourselves and our profession so will we receive the respect of others, and for this reason, if we are to be valued by others we must place a value on ourselves, for we have reached an age when the world will not ferret us out and learn our worth, but we must forge ahead and get to the front by our own efforts.

If the trade is to be elevated it must be accomplished through its own members, and the surest way to do this is to occupy the position which we merit.

That a value is now being placed on our profession is an established fact, and we, as an association, can modestly claim some credit for the result.

Nothing which has served to enlighten the public or better the plumbing business has taken place, either in a mechanical sense or a sanitary science, but which has emanated from Master Plumbers' Associations. We, as master plumbers, should be regarded as men of brains, and our position in the world should rank with that of any professional or business man, and in order to attain this position we must stand together as one man. Our financial condition will become more favorable as we progress and are appreciated.

From the moment that we began to unite as a body for the purpose of helping one another, we placed a value upon our craft never before appreciated. With this knowledge of the past and in view of our interest for the future we must, through our organization, endeavor to keep up the work of educating and perfecting ourselves, and must leave nothing undone which will aid in the elevation of our profession in the public eye. We must seek to become business men as well as artisans. Technical knowledge is not all, as many of us have discovered—we must perfect ourselves in commercial knowledge as well.

Much has already been said regarding the handling of tools by the master, yet this is a vital question, and one well worthy of discussion. If a master desires or is inclined to handle tools, it means that he is trying to save an outlay of money on a mechanic's labor, while he is, in fact, neglecting the most important part of his business. A great many failures may be traced to just this method. If we are to lead at the head, we cannot be subordinate as well.

Every master plumber should be well learned in his business in its entirety, and when this is done he should apply for membership in the Master Plumbers' Association. In union there is strength, and every man should help build up the strength of his own business by being a member of the association, no matter how small his business may be, for he thereby elevates his business and adds to his bank account.

In conclusion, let me say that as master plumbers, one and all, it behooves us to leave no stone unturned toward the achievement of our end, which is to stand in the front rank of the crafts.

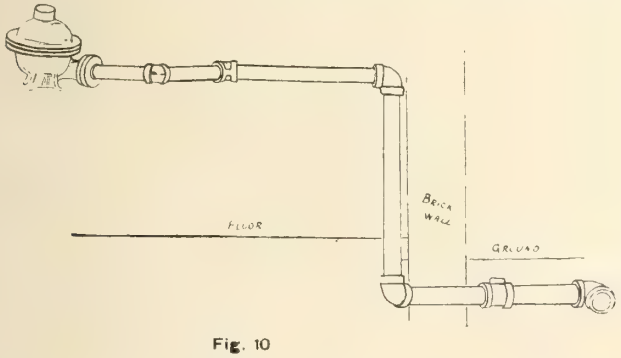


Fig. 10

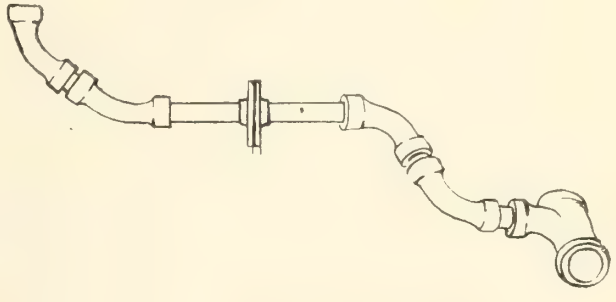


Fig 11

SPLENDID NEW BUILDING.

Purdy, Mansell & Co.'s new building, at 61 and 63 Albert street, Toronto, is undoubtedly the most up-to-date master plumbing house in Canada, and we expect to be able to present a view of their immense display room shortly. The building is 71x117 feet, three storeys and basement, of mill construction and equipped with an automatic sprinkler system. The firm also has 66 feet frontage on Elizabeth street, which will be used at present for a pipe yard. The premises cost about $70,000, and the upper two storeys will be rented, the firm using the basement and ground floor.

RADIATOR EFFICIENCY.

Short, vertical cylinders are presumably the best that can be devised lor giving off heat. If they be increased in height, say two or three times, they would do less duty because the air in contact with the upper parts would have been warmed by the lower part as it passes upward, and, therefore, is not capable of extracting as much heat. The higher a radiator is, the lower its efficiency per square foot of surface, and 36 or 38 inches has been established as a fair limit of height, says the Engineering Review.

Prof. R. C. Carpenter, in a series of tests at Sibley College, demonstrated the fact that "with radiators of the same height and same dimensions no difference could be traced, which was due either to material or to thickness. With radiators of the same material and the same height, but of different depths, or with varying numbers of tubes, we find invariably that higher results are obtained from the thinner radiator or those with the fewest rows of tubes.

Steam Heating in Practice

Heating a Hardware Store—The First of Several Examples—Variations to Meet Different Conditions.

By W. B. MacKay, Toronto.

It will be the writer's endeavor through plans of buildings and descriptions of the same, which afford the opportunity, to examine into the various requirements to acomplish the successful heating of the various apartments or rooms, and to deduct therefrom and summarize the calculations and other such useful data in such form that it will be readily useful to steamfitters in their daily work.

The example chosen to illustrate this article will give ample opportunity to study in brief detail a few of the points that require our attention when we are figuring up the complete apparatus required in a steam-heating plant.

Conditions to be Met.

Examine the floor plans of this store, which is the middle one of three like stores forming a block situated on the north side of the street facing to the south, a lane running along the rear, which leaves the north side with a full exposure. The building is of brick construction, two stories high, as shown by the plans, with a flat roof, and has a good basement under the main store.

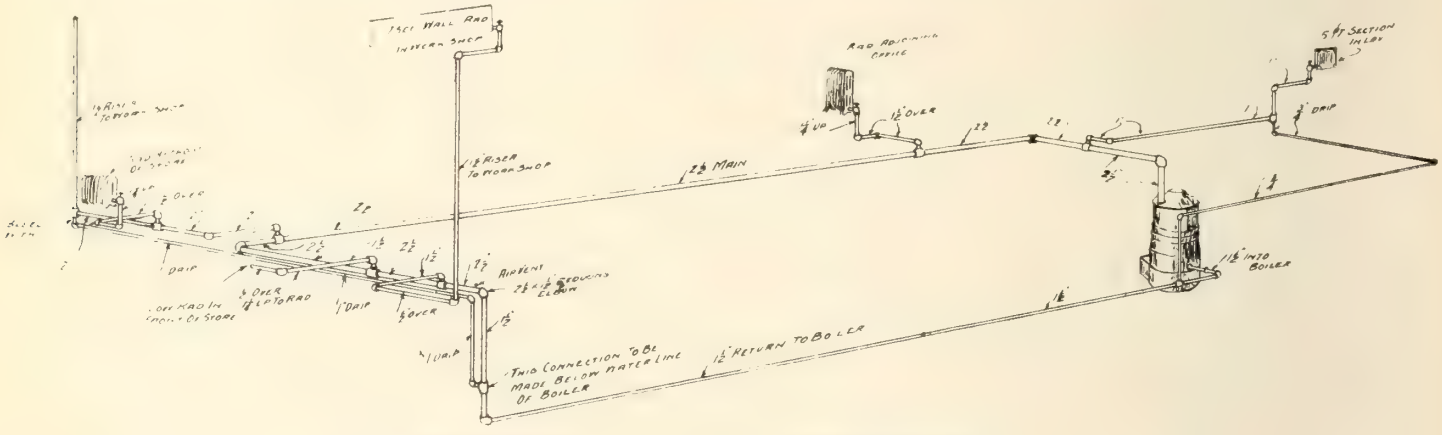
The ground floor is divided into the store proper and a convenient storage room at the rear, with a small lavatory in the corner of the storage room. The first floor is divided into two parts, as is also the ground floor, the workshop occupying about one-fourth of the entire floor space, the remaining part affording ample space for the storage of the lighter articles.

Some features about this particular store, while not connected directly with the question of the heating, will, undoubtedly, prove of interest to all.

Air-tight Window Space.

The display windows at the front are entirely closed off from the store by tight-fitting sliding glass doors. This makes them attractive and useful in all conditions of weather, as the moisture contained in the air is prevented from depositing, in the form of frost, upon the interior surface of the exposed glass; the window space being separated from the store, practically remaining unheated in frosty weather, therefore, the temperatures on either side of the exposed glass cannot vary enough from each other to cause the deposition.

The hoist shown on the plan is another accessory of very great value, as heavy hardware can be effectually handled from the basement to the storage room above on the first floor. A coal oil tank is built of concrete in a pit along-side the excavation necessary for the hoist, and is entirely below the floor line, out of the way. The barrels of oil are received and immediately emptied into this tank to prevent any leakage or evaporation, also to get rid of the barrels so as not to take up floor space in the storage room.



Steam Heating in Practice—Plan of Piping for Hardware Store System

To Determine Radiation.

In determining the amount of radiation required to heat a room or apartment under certain conditions, which are set for us, we have the following factors to consider:

First, the construction of the building, room or apartment, whether good, bad or indifferent; second, the temperature required when the weather conditions are such that artificial heating is necessary; third, the exposure of the building, whether it is well protected or fully exposed; fourth, the cubic contents of the building, as also the number of times the air is changed, according to the use for which the building is intended; fifth, the extent and nature of the outside wall exposure. In conjunction with this, the walls or partitions separating the building from unheated spaces, as vacant stores or apartments, must also be considered; sixth, the extent of the glass surface, taking into consideration whether the windows and skylights are single or double.

Frequently these factors are not given proper consideration and the heating plant is not as successful as it otherwise would be.

Estimating Radiation for Store.

In the store proper the entire front is practically all glass, measuring 22 x 11 feet, amounting to 242 square feet of glass surface.

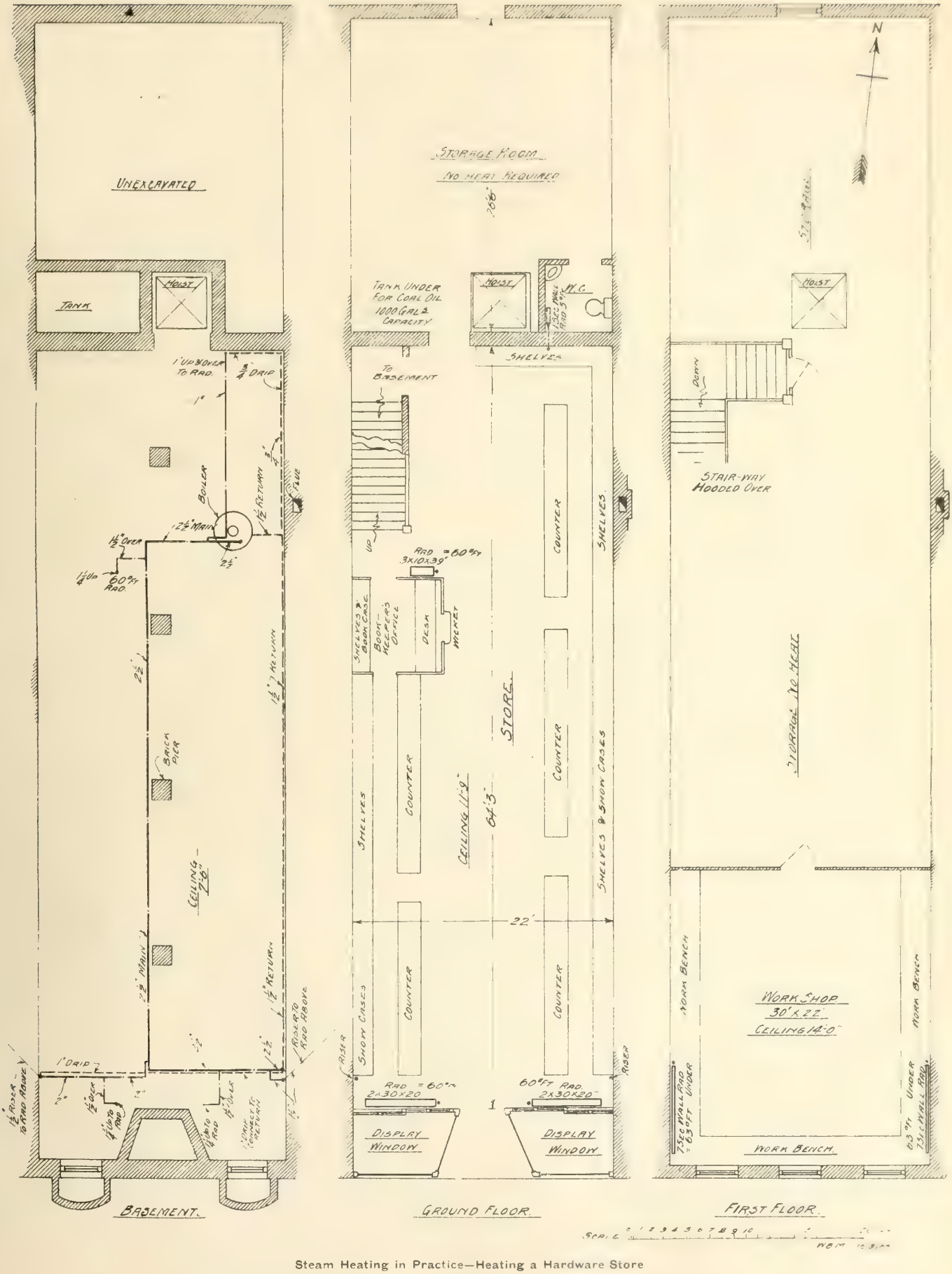
The exposed wall surface of this store being only the wall between the store and the storage room at the rear, and this being a protected wall, the exposure would be taken at about 50 per cent. of the full area of that end. The side walls are party walls and are taken as warm walls.

The amount of radiation required to maintain the cubical contents of the store alone at a proper temperature is also a consideration.

The avoidance of any complicated algebraical formulae will simplify our discussion, and where the use of such formulae is involved we will content ourselves with the results only of the calculation based upon these formulae. So, in totalling the glass surface, the exposed wall surface and the cubical contents of the store, together with the proper factors to be used in conjunction with them, the result amounts to 160 square feet of radiation for 65 degrees at 10 degrees below zero.

There is still to be taken into consideration the direction this store faces, the cold rooms overhead, etc.

The store, as before stated, faces south, and as this is the direction for which all formulae are figured, nothing need be added on that score. The storage room overhead being unheated will have a cooling effect on the store below it. To offset this about ten per cent. should be added, making the amount of radiation necessary in this instance nearly 180 square feet.



Steam Heating in Practice—Heating a Hardware Store

The 160 square feet of radiation would heat this store to 65 degrees at zero outside, and taking into consideration the small exposure and the location, and assuming that the building is of best construction, this last statement could be set down as the minimum amount of radiation required to heat a store of this kind at zero temperature outside. Resolving this into terms of the cubic contents it assumes one square foot of radiation for every 100 cubic feet of contents, the amount decided upon to heat our store amounting to one square foot for every 90 cubic feet of contents.

Different Conditions Considered.

As the minimum has been set, let us consider this store under a different condition, where the exposure is greater, in order to find the maximum amount required per unit of cubic contents. For instance, take this store as one on the northwest corner fronting to the south, with longest wall exposure to the east, having two ordinary windows of plate glass in this exposed side. According to calculation it would then require 230 square feet of radiation for 65 degrees at 0 degrees, including the additional amount necessary to offset the loss occasioned by the cold room above. This last calculation assumes one square foot for every 72 of cubic contents. Suppose the store to be on the opposite side of the street, so facing north and west, an additional ten per cent. would be required, making about one square foot of radiation for every 66 subic feet of contents. Considering the above, one to 60 is deemed sufficient for severe cases, and could be set down as the other extreme, making the requirements of the stores vary from one square foot of radiation for every 100 cubic feet to one square foot for every 60 cubic feet for zero outside temperature.

Likewise in the workroom over the store, if treated in the same manner, requires according to the glass surface, wall surface, roof surface and cubic contents, about 115 square feet, or one to 80. The foregoing schedule will do equally as well for workrooms of this kind, as many phases of this very type of room would resemble very closely the considerations given the store.

Location of Radiators.

A word might be said as regards the selection of the kind of radiators to use and their proper location. 180 square feet may be divided into three radiators of 60 square feet each. It goes without saying that the cold walls and windows are the most desirable places for radiators.

In our store the exposure lies all to the front of the store, so that it is proper to place a convenient amount of radiation to cope with these cooling surfaces. The radiator must be as low as possible to permit access to the show windows at any time, and it must be narrow so as not to interfere with the space required around the end of the counter. It, however, can be of any length up to the width of the window.

A two-wide radiator, about 20 inches high, is found to be about as suitable as any for this particular location. By putting two radiators of the size shown on plan two-thirds of the entire radiation is placed at the front of the store, in the most effective place for it. The remaining radiator may be of the standard height, and can be placed to good advantage alongside the bookkeeper's office to equalize the heating of the store and prevent drafts.

Wall Radiation.

The choice of the radiators and the placing of the same in the case of the workroom brings to our notice two points of interest. Wall radiators are conceded to be the most efficient type of all radiators, but as they take up considerable wall space they are only adaptable in certain cases. It is fair to say that 15 per cent. less surface may be used over the ordinary type of radiators. The placing of the radiators in the workroom should be such that the piping be simplified as much as possible. To this end, radiators placed on the walls underneath the benches serve our purpose admirably. The second point is here brought out in the fact that radiators recessed or placed under benches, where the circulation of air is not as free as when directly exposed, requires additional radiation to be added to offset this effect. It would, therefore, be good practice to put in two radiators of seven sections each, making 126 square feet of radiation, as marked on the plan. Each radiator should be provided with a reliable automatic air vent properly set and adjusted to relieve the radiators of the air in the system.

A boiler should be selected of ample capacity to take care of the radiators and all mains and branches, any of which are uncovered, of course, providing radiating surface as well as the radiators themselves.

The system of piping is fully shown in the accompanying plans, and comment is scarcely necessary. All piping should be properly graded and have a continuous pitch of not less than one inch in ten feet from the highest point near the boiler.

In another article we will take up in more detail the system of piping, its arrangement, erection and workings.

RANGE BOILER CONNECTIONS

By C. E. Oldacre, Toronto.

In these days of the rapid adoption of modern home conveniences, gas water heaters are meeting with great favor wherever a supply of gas is to be had—whether natural or artificial.

They have become, in fact, a necessity, as with them a supply of hot water is on tap almost instantly and with the minimum of expense and trouble. A very short time, and a small amount of gas will give sufficient hot water for the bath. They are at your command day or night, and there is no necessity for starting up a heavy fire in the kitchen coal range. Large or small quantities of water are heated with them most economically. Of course, where a considerable and fairly constant supply of hot water is required, other sources than gas are looked to, and will be for some time yet unless methods are found of producing and distributing gas at a less price per thousand cubic feet.

It is quite usual to find the kitchen circulating range boiler having connections with a gas water heater and the water-back of the coal range, or to an auxiliary domestic water heater placed in the boiler used for the hot water heating of the house, and it is not infrequent to find all three of them connected to one circulating boiler.

Couldn't Get Hot Water.

Sometimes these double connections, which are made under varying conditions, lead to complications and uncertain and unsatisfactory results.

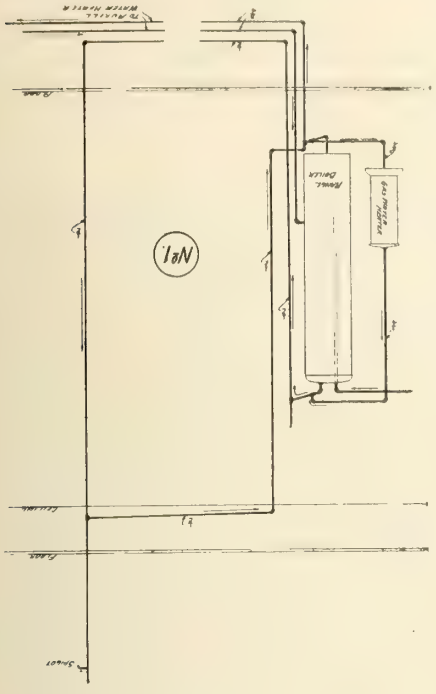
Not long since, the writer had occasion to examine into a case where the circulating range boiler was connected to one of these gas water heaters and to a domestic water heater in the house heating boiler. These connections are illustrated in Fig. 1. The parties complained that they could not get a satisfactory water supply of hot water. There are five outlets for hot water on the one-half inch galvanized iron line leading from the circulating boiler. Only one of these outlets are shown—this one being the one at the bath tub in the bathroom on the first floor. Just what was the trouble was quite difficult of discovery, as practically all of the hot water supply line of pipe was concealed and it was hard to see what purpose the line that leads from near the bottom of the boiler and rises up along the side of the boiler and passes between the joist, was intended to serve. Otherwise, the work, with some exceptions, which will be noted later, seemed fairly good, so that without tearing up finished floors or cutting out partitions it looked as though it would be impissible to locate the difficulty.

It was noticed, however, that the circulation in the two pipes leading from the auxiliary domestic heater to the boiler was reversed, that is, that the one marked in Fig. 1. as the flow pipe was acting as the return, and that the one marked as the return pipe was acting as the flow pipe.

How the Problem Was Solved.

But when the hand was placed on the line leading upward from a connection near the bottom of the boiler and connecting into the main supply pipe for hot water between the joists, that there was a sudden movement of hot water through this pipe, followed by cold water when the tap in the bath-room was opened, and this intermittent action was simultaneous with the opening and closing of the tap keeping in perfect time with this operation. This at once led to the solution of the difficulty, as whenever the tap was opened, cold water from the bottom of the boiler was being forced

through the course of least resistance—this rising line spoken of—to the outlet, mixed with the warm or hot water coming from the top of the boiler through the regular hot water supply connection. The hot and the cold water being mixed—more of the cold than the hot—only gave a fairly luke-warm water at the bath tub tap. Also it solved to



a certain extent the cause of the reversed circulation in the circulating pipes to the auxiliary domestic heater as it will be noticed, if the connections are followed, that the return pipe has a direct connection through the gas water heater to the top of the boiler, to which point is the tendency of the warm or hot water ro rise, particularly as the flow connection only reaches to the regular flow tapping on the circulating boiler intended for use with the ordinary water-back of the coal range.

What would be the course of the water through the various supply and circulating pipes, as thought evidently by the fitter putting in this work, is shown by the arrows in Fig. 1. And if the course of the water had been so, then it would have worked all right; but it did not do so, as related previously.

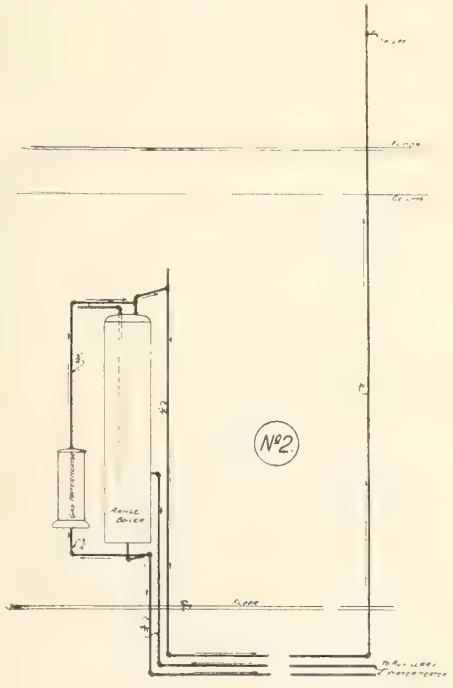
The Remedy Applied.

The remedy for the mixing of the cold and hot water is shown in Fig. 2—that is, the dispensing with the pipe connecting near the bottom of the boiler, as also into the main hot water supply pipe, as shown in Fig. 1. Of course, in this case if no hot water is drawn for quite a period of time from any outlet on the main hot water supply pipe the water contained therein will become cooled and it will be necessary to draw off this cold or cool water before hot water is obtained at the hot water tap.

A better connection at the top of the boiler for circulating pipe from the gas water heater than the one shown in Fig. 1. is also shown in Fig. 2. Both of these connections require the same fittings, but the one shown in Fig. 2 gives the best results.

If it is desirable that hot water should be had practically at once from the tap in the bath-room, as illustrated in the cuts, this is easily accomplished by making the connections as shown in Fig. 3. This is what is known as the "circulating system," and is particularly applicable if the bath-room is located at some distance from the circulating range boiler. It might be pointed out, in connection with the above that it would have been much better to use ¾-inch or 1-inch galvanized iron pipe for the main hot water supply, instead of ½-inch pipe, as shown—particularly on account of the length of the run and the number of outlets necessary to be supplied, any two or more of which might be in use at one time. This would give a more even flow of water to the different outlets. The cost of the larger pipe would have been but little more and would have given much better satisfaction.

Further illustrations and description of the various methods of heating water for domestic supply and other uses, together with the required connections, will be taken up in later articles, showing how the best results may be obtained, as also the causes for complaints in connection with this work.



TECHNICAL EDUCATION FOR MECHANICS.

One of the big problems of the present day is that of securing well trained mechanics. Direct evidence of the seriousness of this problem is the interest which so many large firms and also associations and societies are taking in the question of apprenticeship courses and technical training. Skilled mechanics cannot be produced within a day's notice. They must get a thorough training in, one way or another; and the ever increasing demand for these men in Canada, as the country expands, makes the problem, as to how best to train young men and boys in mechanical lines to fill positions as necessity demands, a most vital one.

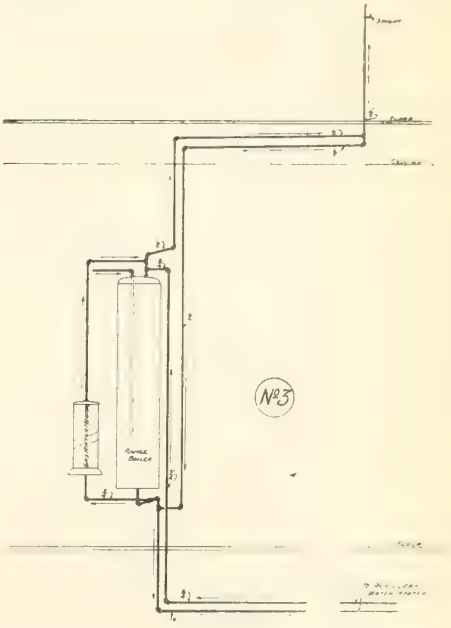
It is impossible to draw a distinct line between the engineer and the mechanic. Looking at the question broadly, it might be said that the engineer is a mechanic who, because of greater ability or because of closer application to work, has reached the higher rung of the ladder of [illegible] mechanic but it is true that frequently the best of engineers are not trained mechanics and frequently the best and brightest of mechanic would make very poor engineers. The good engineer must be something more than a mechanic. The relative merits of college men and practically-trained men as engineers are often a matter for discussion; but this cannot be discussed to advantage except in relation to some particular case.

The question of training for mechanics, however, is apart from this. Because of the great advances in methods of manufacture during recent years, the good mechanic of to-day requires a better general education than in years gone by, and also a more complete technical training. In metal working industries the technical training required is along the line of mathematics used in simple designing, in elementary mechanics, and in mechanical drawing, together with information of a general nature concerning the line of work to be followed, which should deal particularly with things which cannot be picked up in the shop.

Quite a large number of firms in Canada and the United States have apprenticeship courses, which include a technical as well as practical training; and this certainly appears to be one of the best methods of solving this problem. At the same time the Government, civic authorities, boards of trade, and employers' associations, should do all in their power to promote the cause of technical education in Canada; and if this matter is gone into with enthusiasm, we will, in time, have as complete a system in Canada as exists in Germany, and other countries.

NEW APPOINTMENTS.

E. Jennings, formerly with the Gurney Foundry Co., at Winnipeg, for about



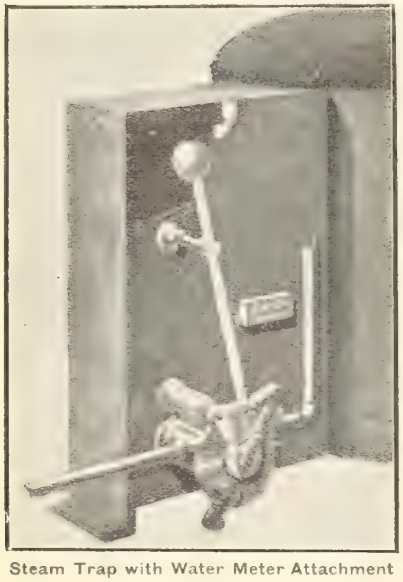
eight years, has been appointed manager of the new Winnipeg branch of Warden King & Son, Montreal, and Cluff Bros., Toronto. J. F. Birchard, formerly with Coleman & Son, Hamilton, has also been appointed to represent the firms in northern and western Ontario.

SOMERVILLE'S BRASS GOODS.

Fred Somerville, general manager of Somerville's, Limited, Toronto, is smiling these days, and it's a good time to meet him if you want a smoke and haven't got a cigar. No, it isn't a boy —nor even a girl—but it's a child of Fred's brain, the monster brass works which he has been incubating under his hat for some months.

Fred took over the management of the Ontario Lead & Wire Company a few years ago. It was a big business, but Fred wasn't satisfied, as it wasn't his own. He set to work to build additions to the foundations which had been so well laid by his father, however, and the trade were soon invited to call and inspect the finest display room in Canada in the new office and display building on Richmond and Church streets.

The old Lombard street headquarters were completely outdone by the modern home of the company—but still Fred wasn't satisfied. Next on his bill of fare was the selling of the white lead and wire nail plants, to make room for the enlargement of the plumbing supply end of the business—and, by the way,



Steam Trap with Water Meter Attachment

this has made possible the fine new display room for range closets, range lavatories and urinal stalls which is now being prepared.

Still unsatisfied, the young Napoleon looked for wider fields for his operations and prepared the way by changing the name of the company to Somerville's, Limited, and widened its business powers so as to allow it to go into the brass manufacturing field. He went over to the States a few weeks ago and bought a modern brass works plant and then came home and looked around for a site, at last securing one on St. Helen's avenue, beside the railway tracks between Dundas and Bloor streets in the west end of Toronto. Here ground has been broken for a factory which will have over 50,000 square feet of working space. Building will be rushed and as soon as the roof is on, the brass plant from over the border will be torn down and brought to Toronto to be put together here. By September, it is promised, the plant will be in operation turning out all kinds of brass goods used in the plumbing and steam-fitting trades. The work will be facilitated greatly by the purchase of a complete set of patterns, along with the plant, thus saving nearly two years' work. Closet tank linings will also be made at the new works.

The new site adjoins the new works of the King Radiator Co., in which Mr. Somerville is interested, along with the Warden King and Cluff Bros. interests. Across the tracks are the Fairbanks-Morse and Toronto Furnace and Crematory Works, and a little farther north the Canada Foundry and new Dominion Radiator Company's plant.

As we said before, Fred is feeling good —but he isn't yet satisfied. What man with red blood flowing through his veins would be satisfied when he has a lifetime of activity before him? Fred is still near the 30-mark, and he won't be ready to say "23" for a good many years yet.

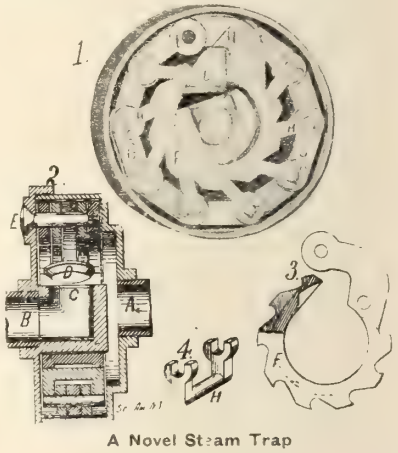
TRAP WITH METER ATTACHMENT

A stream trap has recently been invented which not only operates in a very efficient manner to discharge the water of condensation from a steam pipe or system, but serves, as well, to measure the quantity of water discharged. The trap comprises a cylindrical tank and a narrow rectangular casing connected thereto. In the tank is a float, which is shown in dotted lines in the engraving. The float rod is secured to a rock-shaft that projects from the casing through a stuffing box. The outer end of the rock-shaft carries an arm provided with a counterweight at its upper end, and having, at its lower end, a toothed segment. Meshing with the latter is a segment gear wheel, mounted to rotate freely on the shank of a valve head. The valve, which is of the three-way type, governs both the inlet and the discharge pipes of the trap. A square stem projecting from the valve-head shank carries a short arm, to the outer end of which a spiral spring is secured. The opposite end of the spring is fastened to a pin carried by the segment gear wheel. In operation, as the water of condensation accumulates in the tank, the float rises and, by means of the toothed segment, revolves the gear wheel and with it the pin to which the spiral spring is secured. The valve, however, remains at rest, being held by the spiral spring. When a predetermined level of water is reached, the spring is carried by the revolution of the gear wheel past the centre or axis of the valve-head, and it then quickly retracts, turning the valve to close the inlet and open the discharge pipe. As the water pours out of the tank the float falls, and the gear wheel is turned in the opposite direction, carrying the spring past the axis again, but in the opposite direction, and returning the valve quickly to its first position. A counting mechanism is secured to the casing, in position to be struck by the segment arm just before each discharge. As the same measure of water flows out each time, the counter serves as a meter, showing the total quantity of water that has passed through the trap. A patent on this trap has been secured by Alfred L. Riggs, Ebensburg, Pa.

A NOVEL STEAM TRAP.

The purpose of a steam trap, as is well known, is to permit the flow of water while arresting the escape of steam. Usually this is accomplished automatically by means of thermostatic devices, which operate to close a valve when the temperature rises with the presence of steam in the trap. The trap, which is herewith illustrated, belongs to this same general class, but the method of applying the thermostatic principle is decidedly unique.

As shown in the cross section, Fig. 2, the trap is fitted with inlet and outlet pipes, A and B respectively. Communicating with the outlet B is a valve seat C, in which the valve D is adapted to be seated. The valve D is carried by a lever that is fulcrumed to an expansion collar F. This collar, as best shown in (Fig. 3) is split and is formed at the sides with notched flanges. One end of the collar is formed with an arm, which is fastened to the casing of the trap by means of an eccentric pin E. This pin also serves to hold one end of an expansion chain G, the opposite end of which is attached at I to the lever that carries the valve D. Seated loosely in the notches of the expansion collar F are a series of U-shaped rockers H (Fig. 4) whose forked engage the pins that join the links of the expansion chain. Fig 1 shows



A Novel Steam Trap

the normal position of the parts, when the water is free to flow from inlet. A through valve seat C to outlet valve B. After the water has escaped and steam begins to flow into the trap, the collar F and chain G will expand with the increase of temperature; and as they are both secured to the casing at E, the expansion will take place in opposite directions. The rockers will then swing inward, or toward the expansion collar, permitting such elongation of the chain as will seat the valve D. Relative positions of the various parts may be adjusted by turning the eccentric pin 20. The inventor of this novel steam trap is John Langridge, 108 High Street, Ramsgate, England.

BRITISH PIPE IN CANADA.

Some years ago, cast iron pipe manufactured in the Old Country, enjoyed quite a sale in the Dominion, but lately the high duty on this line caused quite a decrease. With the birth of the British preferential tariff, however, it would naturally be supposed that business would again brighten up, and

with the intention of finding out something of future prospects, our representative called on the Montreal agents of a large Glasgow house.

These gentlemen agreed that under existing circumstances there should be a good market here for British soil pipe, and in fact some lines are at the present time selling extremely well, especially in British Columbia and the west. There are two causes, however, which will prevent certain lines from coming into great demand, and they are: First, the price. They claim that they can't bring British soil pipe over here and sell it in competition with certain lines of Canadian goods and make any profit, and secondly, the manufacturers on the other side don't seem to care whether their goods suit the market or not. The average space from floor to ceiling in most buildings in this country, is 10 feet, and in order to suit this, the pipe should be made in five-foot lengths, allowing the joint to come midway between floor and ceiling, and the top extremity of the pipe flush with the floor above. Some manufacturers, for reasons of their own, [illegible] refuse to make their pipes in anything but [illegible] foot lengths, and when these are used under the above circumstances, there would be two feet of pipe above the floor that would have to be cut off and wasted, being too short for any purpose.

When the British manufacturers awaken to the fact that circumstances alter cases, and are willing to send pipe over here that will suit the Canadian market, they will do a good business. Until then, they can't expect very much.

Group of office staff, journeymen and helpers employed by Thompson & Livock, one of Ottawa's largest master plumbing and steamfitting concerns.

BOOK REVIEW.

"Principles and Practice of Plumbing," by J. J. Cosgrove, is without doubt worthy of being the hand book of the plumbing trade, it being a work that should be at every plumber's elbow for ready reference.

Besides the excellent classification in the subject matter, the book is provided with a complete table of contents, as also an index for ready reference to almost any point that may arise.

This work is a complete exposition of the art and best practices of the plumbing trade as known to-day, and no matter how many other a plumber may have he should by all means have at hand a copy of Cosgrove's work as it contains the essence of the best of all.

Many tables of use every day are given and in addition they are made easily understandable by numerous examples set forth in the very clearest manner. It is written in an easy and plain style that is most readable and is nowhere tedious. It is the book for every plumber, no matter whether the merest tyro or the most accomplished artisan.

Mechanically it is a masterpiece—well printed on good heavy paper with clear distinct type of a fair size, well illustrated and most conveniently sub-headed throughout the entire subject matter. Although a book dealing more with plumbing materials than plumbing work, it is a treatise that should be in the possession of every one interested directly or indirectly, in the plumbing business.

Canadian plumbers can avoid trouble with the customs officials by ordering through the MacLean Publishing Company, Toronto, publishers of The Plumber and Steamfitter. The price is $3, the same as in the United States.

BUILDING ACTIVITY THROUGHOUT CANADA

The Imperial hotel, at Galt, will be enlarged.

Port Arthur Baptists will erect a new church.

Baptists of Woodstock will build a $20,000 church.

Methodists of Barrie will build a new $10,000 church.

Baptists of Port Arthur will build a $30,000 church.

T. Cox, Tilbury, will erect a brick block for stores.

A six-storey apartment house will be erected at Hamilton.

A large, new hotel will be built at Saskatoon this summer.

A new theatre, costing $50,000, will be built at Vancouver.

The Canadian Brass Mfg. Co., Galt, will erect a large factory.

A ten-roomed school, costing $40,366, will be built at Lacombe, Alta.

Nena St. Baptists in Winnipeg are building a new $40,000 church.

An $8,000 addition will be made to St. Andrew's Church, Brantford.

The Crescent Turkish Bath Co., Montreal, will erect a $40,000 structure.

A new eight-roomed public school will be built at Midland to cost $30,000.

A new two-storey post office and customs house will be built at Saskatoon.

Medicine Hat will build a new high school to cost $50,000, including the site.

A new public school, costing $17,000, will be erected at Norway, this Summer.

Toronto will spend $411,500 on school buildings and improvements this Summer.

A new Presbyterian church, costing $19,000, will be erected in Rosedale, Toronto.

Queen's avenue Methodist church. New Westminster, B.C., will be enlarged this summer.

Finger & Holsworth will build $16,000 worth of houses in Fort William this summer.

The King Edward VII. School Co., of Macleod, Alta., will build a new $10,000 school.

Tenders are being asked for the new waterworks system for the town of Simcoe, Ont.

West Fort Presbyterian congregation will make renovations to their church costing $1,700.

The congregation of St. Augustine's church, Lethbridge, will erect a new $25,000 stone building.

The Central Presbyterian church to be erected in Hamilton will cost $175,000, and the organ $15,000.

A permit has been granted to N. N. Cohen to erect an apartment house on Madison Ave., Toronto.

A new school costing $50,000, and a residence for priests, costing $20,000, will be erected in Montreal.

The ratepayers of Port Elgin, Ont., by a majority of 126, passed a by-law to raise $10,000 to complete and extend the new waterworks system.

An eight-storey annex to the King Edward Hotel, Toronto, will be erected on Duke St. to cost $75,000.

A new Salvation Army barracks, a masonic temple and a new theatre will be erected at Fort William.

The Royal Bank of Canada will build a $50,000 branch at Vancouver, on the corner of Hastings Street and Westminster Avenue.

The new church of St. Mary Magdalene, to be built on the corner of Manning avenue and Ulster street, Toronto, will cost $45,000.

T. J. Campbell, of Midland, has secured the contract for heating and ventilating the new 8-room public school there, using the Pease system.

NEW HEATING CATALOGUES.

Warden King & Son, Montreal, have issued three booklets describing respectively their "Daisy Boilers," "Iron Pipe Fittings," and "Soil Pipe and Fittings." The booklet on Daisy Boilers contains a detailed description of them, with illustrations and the latest prices. With the March, 1907, catalogue of soil pipe and fittings, containing illustrations and full price list, is a detached discount sheet applying to that catalogue on all soil pipe and fittings. Their 55-page catalogue of iron pipe fittings is well illustrated and contains full price lists on all their lines of manufacture. These booklets will prove valuable to the steamfitting trade and may be had on application to Cluff Bros., Toronto, agents for Warden King & Son. Mention this paper.

STRIKE LIKELY AT HAMILTON.

Plumbers in Hamilton have recently made a demand for an increase of their wages from 35 to 40 cents an hour, and also for a new agreement, a number of clauses of which do not meet with the approval of the employers. The plumbers are satisfied with the nine-hour day. The following are the clauses in the agreement which the employers object to: (1) That if the men are obliged to work until six o'clock during the busy season, from September to December, they shall be paid for the extra hour as overtime; (2) That apprentices shall not use tools until they have served four years, unless accompanied by a journeyman; (3) That apprentices who have served four years be paid 30 cents.

The employers are unanimous in their decision not to grant the demands of the men and a strike seems certain.

KINNEAR RADIATORS.

A. Welch & Son, 302 Queen Street West, Toronto, Ontario selling agents for the Kinnear Pressed Radiator Co., Pittsburg, are making considerable progress with their agency. Purdy & Mansell, Toronto, have been awarded the plumbing and heating contract for H. H. Fudger's new residence, where $1,450 worth of Kinnear Pressed Radiators will be installed. Many advantages over the cast type are claimed for these. They are smaller and much lighter than the cast radiators, so light that a man can carry 64 feet of it. They have absolute control of the heat, and will not burst with the frost. It is also claimed that they will hold 40 per cent. less water than the cast radiators and consequently effect a great saving of fuel.

SPRINKLER SYSTEM APPEAL.

The D. D. Hawthorne Co., and the Boulter-Davies Co., both wholesale dealers in boots and shoes and occupying warehouse portions of the building 24 Front Street West, Toronto, had their stocks insured against damage by water from an automatic sprinkler system installed in the building, with the Canadian Casualty and Boiler Insurance Co. The two companies had sued for damages done. An appeal was dismissed and judgment was given in favor of the plaintiffs, in the first case for $5,133.56, and in the second case for $4,158.70.

KEWANEE WATER SUPPLY.

The Kewanee Water Supply Co., of Kewanee, Illinois, have issued a beautifully gotten up booklet of 32 pages, containing nicely written descriptions of their various lines of water supply outfits. The booklet throughout is so entertaining that it is much more than a catalogue. At the back of the book are two pages of answered questions regarding water supply systems, with valuable information. The book should prove invaluable to all interested in water supply systems, and may be secured by applying to the company, mentioning this paper.

CHAIN FOR PIPE HANGING.

The Oneida Community Company are manufacturing a chain for pipe hanging which consists of two parts. An adjustment screws solidly into the ceiling, on which is hung a strong chain which holds the pipe. This chain may be shortened or lengthened at will, thus allowing the pipe to be hung at any distance from the ceiling. This is a very simple and convenient device and is becoming very popular. Readers may obtain additional information by writing the Oneida Community Co., Oneida, N. Y., and mentioning the Plumber and Steamfitter.

SEPTIC TANK TESTIMONIALS.

Readers of The Plumber and Steamfitter who installed septic tank systems two or more years ago and who have secured testimonials from the customers, will confer a favor on a subscriber in Ontario if they will forward a few of these testimonials for publication in this paper. The subscriber finds it difficult to induce some of his customers to adopt septic tanks and not being able to produce any testimonials or to refer the customers to any persons to whom they could write, he sends the request we have made above.

NEWS OF THE TRADE IN CANADA

T. Lessard & Sons, plumbers, Montreal, have been registered.

Tenders are being asked for a water works system for Thorold.

A. Bussault and O. Gingras, plumbers, Montreal, are registered.

Gagnon & Giguere, plumbers, Levis, Que., have commenced business.

J. C. Leblanc, Joliette, Que., was in Montreal last week on general business.

Tenders are out for waterworks systems in Battleford, Sask., and Point Edward, Ont.

The wife of W. J. Fulton, manager of the Dominion Radiator Co., died at Winnipeg, after a brief illness.

J. Carling, Canadian representative of the Lunkenheimer Co., Cincinnati, is on a western trip as far as Kenora.

The Amherst Foundry Co., Amherst, N.S., has made some large shipments of enamelware to western Canada recently.

Joseph Bourgne, St. Julienne, Que., was in Montreal last week in connection with installing a new tinsmith shop.

The Canada Foundry Co., Toronto, have been awarded the contract for supplying the city with cast-iron pipe for the year.

Blyth & Watt, hardware and plumbing supply dealers, Ottawa, have dissolved, Chas. Watt continuing the hardware business alone.

W. J. Cluff, of Cluff Bros., Toronto, has returned from a trip to Winnipeg, where he opened up a branch of the Warden King Co.'s business.

Chatham will vote on a by-law to approve of the location in that town of a branch factory of the Wolverine Brass Works, of Grand Rapids, Mich.

Andrew Rodgers & Co., Hamilton, have changed their firm name to Rodgers, Gibson & Co. Andy has taken his foreman, Mr. Gibson, into partnership.

Fred C. Mount has closed his plumbing shop at 1001 Bloor Street West, Toronto, and is now conducting business at his residence on Bartlett Avenue.

John Keepe, manager of the St. John, N.B., branch of the James Robertson Co., reports that business in plumbing supplies is first-class. Many orders are coming in and the outlook is bright.

F. T. Drake, manager of the Vancouver branch of the McClary Manufacturing Co., is on a trip to Europe, where he will spend a couple of months pleasure-seeking. J. M. Gunn is relieving Mr. Drake.

R. W. Harrison, one of Toronto's best known master steamfitters, has booked his passage for Europe, leaving New York on May 18. When the expected strike is over, and business becomes profitable again, "Bob" will return.

W. H. Meadows, J. N. O'Neil and Benjamin Kirk, city plumbing inspectars, have had their salaries increased from $1,075 to $1,200, and Wm. Copping, a city plumbing inspector, has had his salary increased from $979 to $1,075.

Summers & Kelly, Regina, have secured contracts for the plumbing and heating of the new Regina city hall, the Wascana hotel, Michalis block, Armour's block, Montreal bank at Regina, and another branch of the same bank at Indian Head, Sask.

The strike of the metal polishers, buffers and platers, in progress at the James Morrison Brass Mfg. Co.'s works, Toronto, for the past four months, has been settled, and the men will receive $2.75 a day. A number of the men have in the meantime secured positions elsewhere.

The office and shipping staff of the Labatt Manufacturing Co. a week ago presented Miss Elsie J. Drewe, who has for some time been in the company's employ, but is now removing to Toronto, with a handsome and costly parasol. The presentation was made by Miss C. Borland and a feeling address was read by Wm. Footit.

George A. Wooten & Co., plumbers and stove dealers, Halifax, have just completed the purchase of the property adjoining the firm's premises on Barrington St., and also the property in the rear running through to Argyle St., Halifax. The price paid is said to be $30,000. A brick and stone extension will be built, and the upper floors will be used for the firm's steamfitting and plumbing plant.

The new Canadian plant being established at Montreal by Jenkins Bros.', will be ready to produce goods in June or July. About $200,000 is being spent on buildings and machinery and the output will be very large as, in addition to supplying the Canadian trade, the company proposes to export about 75 per cent. of the product 'to Great Britain, Australia, and other countries where the Canadian tariff is more favorable than on goods made at the parent factory at Boston.

The McClary Mfg. Co., London, have issued a new catalogue of gasoline fire pots and torches. It contains fifteen pages of well illustrated, interesting reading matter regarding this line of manufacture. The McClary Mfg. Company have now begun the handling of plumbers' supplies, having branches throughout the Dominion from St. John to Vancouver. The company, with their already extensive plants, should be in a good position to supply the plumbing trade.

PLUMBING AND HEATING MARKETS

TORONTO.

The conditions of the plumbing trade are good and are continually strengthening as spring advances. Business in the cities is very good, but as spring has been backward in the northern and western districts, little trade has been done there.

The prospects for the trade this summer are good, as the volume of building operations will be unequalled. One supply man predicts that the trade will have more business during the coming summer than they can handle.

Enamelware prices are still being cut to pieces, despite the fact that a strong demand for the line obtains.

Although the scarcity of iron pipe is not felt to be so acute at present, there is no getting around the fact that if the American mills are experiencing increasing difficulty in procuring raw material, Canadian supply houses may in the future find a great delay in shipments. In fact, some are doing so now, in the smaller sizes. A good demand for iron pipe prevails. Prices remain unchanged, the base price on black still being $5.12 and for galvanized, $6.77.

Prices on soil pipe are being cut to pieces at present, the alleged reason being a disagreement amongst the manufacturers. The discount on pipe up to 6-inch, is now 65 per cent.

Heavy orders continue to arrive for lead from the Northwest. Ontario business continues steady, with a fair demand. The discount is still 5 per cent.

The feature of the heating trade continues to be the unprecedentedly low prices on radiation.

Galvanized and copper range boilers experience a good demand with firm and unchanged prices. There is no change in the situation in solder, prices continuing firm and unchanged, with a fair demand.

The likelihood of business being tied up by strikes is affecting trade in Toronto, buying being curtailed considerably, except in roughing-in materials.

MONTREAL.

Although a small percentage of people refuse to buy plumbing goods, just at present, on account of the higher prices which have prevailed this year, the great majority have realized that they must have the goods at any cost. We do not mean by this that dealers are charging exorbitant prices, but the fact is that when advances began to take place, many people thought they were merely fluctuations, and sat on the fence, waiting for the drop that never came.

The iron pipe situation seems to bother many people and a short explanation as to how things are run would not be amiss.

Several times within the past few months the report has been abroad that there was a shortage in certain lines. When the mills start to make a certain size of pipe, they run for a week and sometimes ten days on that size, without touching any other. Therefore, if a certain dealer wants, say, a lot of one inch pipe, and applies to the mills for it, they will consult their rolling schedule and probably find that they will not be starting a lot of that particular size for perhaps two or three weeks. This particular dealer, and probably several others in the same position, are short on one-inch pipe and, naturally, their customers are no better off.

One Montreal house, in order to prevent this sort of thing, some time ago built a large storehouse lor black and galvanized pipe, where they keep their stock far enough ahead that they at least, seldom, if ever, run out of any sizes. This seems to be the only way to handle the pipe situation satisfactorily, and if more dealers were to adopt the same plan, it would be of great benefit to the trade in general.

ROBERTSON'S MARBLE LAVATORIES

In addition to the goods illustrated, we manufacture and carry in stock a full line of staples, such as Brass Compression, Fuller and Ground Work, Soil Pipe and Fittings, Iron Pipe and Fittings, Engineers', Gasfitters', Steamfitters' and Mill Supplies. A Catalogue for each of these departments will be cheerfully forwarded on application.

The James Robertson Company, Limited

265 King Street West, TORONTO

Wrought Iron Pipe and Cast Iron Fittings

Our Stock in these lines is complete. Can fill all orders promptly. Be supplied before the Spring rush commences.

WM. STAIRS, SON & MORROW, Limited, HALIFAX, N.S.

We make Electric Fixtures, Sockets, and Cut-Outs

Munderloh & Co

Electrical Supplies of all kinds. — MONTREAL.

KERR'S GLOBE AND GATE VALVES
STRICTLY HIGH GRADE. TESTED & PACKED
THE KERR ENGINE CO. LIMITED
VALVE AND HYDRANT MANUFACTURERS
WALKERVILLE, ONT.

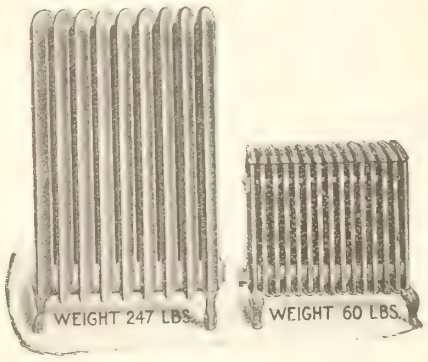
SCIENTIFIC DRAINAGE IN CAST IRON
HYGIENIC SANITATION CAN BE OBTAINED BY USING MACFARLANE'S GLASS ENAMELLED DRAIN & SOIL PIPES WHICH ARE RECOMMENDED AND SPECIFIED BY THE LEADING SANITARY AUTHORITIES
HYGIENE
WALTER MACFARLANE & Co
SANITARY ENGINEERS.
CASTINGS SUPPLIED CUT & FITTED TO REQUIRED MEASUREMENTS DRAINAGE PLANS ARRANGED CATALOGUES ON APPLICATION.
SARACEN FOUNDRY, GLASGOW.

AGENTS:

W. PORTEOUS JACK, 1256 Robson, Vancouver.
GEO. PEATT & CO., P. O. Box 466, Winnipeg, Man.
BAXTER, PATERSON & CO., 102 St. Antoine St., Montreal.

Mr. Steamfitter!

Here are Two Pictures. Just Look at the Difference.



If you want to please your customer give him

Kinnear Pressed Steel Radiators

He will like their appearance. Save half the space that cast ones will take up, heat his house in less than half the time. You will save money in freight and men's time handling, and get a reputation of being right up to date. Kinnear Radiators occupy half the space of cast ones, hold 38 per cent. less water, heat in one third the time and heat same amount of space for same number of feet of radiation.

For Further Particulars Write

A. WELCH & SON, 302 Queen West, Toronto

Agents for Ontario

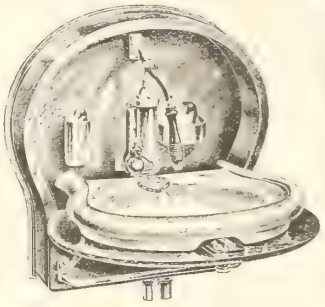
TRADE MARK J.M.T. A GUARANTEE OF QUALITY

We manufacture the largest variety in

Plumbers' and Engineers' Supplies

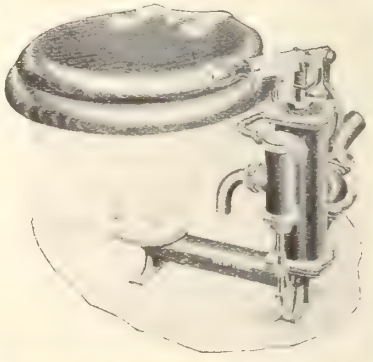
Brass and Iron Goods

Our products are made of carefully selected materials, and workmanship the best to give our customers "high grade" goods at reasonable prices.



Yacht Lavatory Fixtures

Folding Basin with Pump attachment.



Pump Water Closets

We make and handle a variety of Marine Brass Work and Supplies.

Engine Room Supplies
Brass Railing Work
Whistles, Fog Bells, etc.

The James Morrison Brass Mfg. Co., Limited, 93-97 Adelaide St. W., Toronto

Plumbers

interested in increasing their knowledge of **how** to properly lay out and install the plumbing work in large Hotels, Apartment Houses, Business Buildings, Schools, Sanatoriums, Public Institutions, etc., should have a copy of

Principles and Practice of Plumbing

By J. J. COSGROVE

It has nearly 300 pages of carefully compiled reading matter and should be used as a handbook by every one interested in Plumbing and Sanitation. For the present it can be secured for only $3.00 postpaid. Avoid trouble with customs officials by ordering from

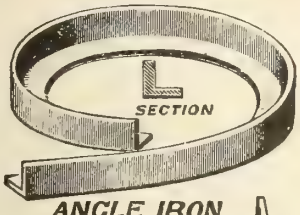
MacLean Publishing Company

MONTREAL TORONTO WINNIPEG

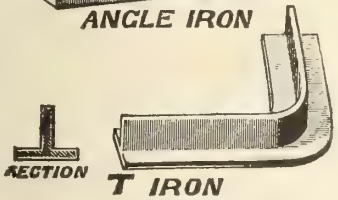
A TIME SAVER!

Kennedy's Patent Bending Machine

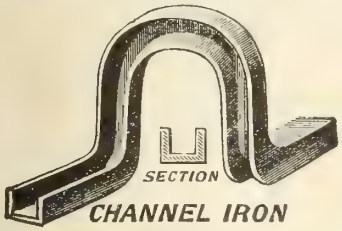
HALF ROUND



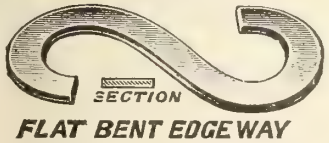
ANGLE IRON



T IRON



CHANNEL IRON



FLAT BENT EDGEWAY

SOLID SECTIONS BENT COLD

USED BY GENERAL ENGINEERS, ELECTRICAL ENGINEERS, GAS FITTERS, PLUMBERS, Etc.

For bending welded, butt-jointed and seamless tubing; also round, flat, angle, tee and channel bars, in copper, brass, iron or other metals.

This machine, like the tube vice, stocks and dies, etc., will undoubtedly become one of the pipe fitter's regular tools, included in his kit, and taken out with him on every job.

Any number of bends can be made at any angle and in any position on long lengths of work

doing away to a large extent with stock elbows, bends and sockets, also saving a large amount of cutting and screwing, thus reducing the possibility of leaky joints. Tubing within the dimensions stated below are bent ***cold,*** without annealing or loading in any way.

ADVANTAGES

Makes a smooth, continuous, neat and more finished job.
Saves cutting and screwing.
Saves stock bends, elbows and sockets, causing ugly and possibly leaky joints.
Tubes bent cold without bulging, and yet without loading or annealing.
Any number of bends made on a single piece of work.
Repeats bends exactly.
Compact, yet portable and strong; can be fixed to any bench.

Specimens on exhibition at
THOS. ROBERTSON & CO., LIMITED, 734 Craig St. W., MONTREAL

Prices and particulars may be obtained of
THOS. ROBERTSON & CO., LIMITED, MONTREAL
JAS. ROBERTSON & CO., LIMITED, King St., TORONTO
J. A. BERNARD, 21 St. Peter St., QUEBEC

For agencies in other districts write

WM. O. GREENWAY, 13 St. John Street, MONTREAL

No. 7 Hand Drill

Cut gearing, change of speed for light or heavy work. Ball bearings, Rack and pinion feed, either hand or automatic. Treadle feed to lower the spindle to the work. A weighted lever raises the spindle instantly as soon as the feed is disengaged. Incomparably the best hand drill in the market, and also a first-class wood boring machine. Fitted for power if desired without extra charge. Weight 375 lbs. Send for circular.

It pays to use the best tools.

A. B. JARDINE & CO.
HESPELER - - - ONTARIO

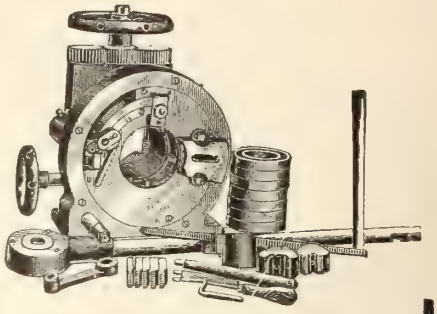
This is the Mark that Means Something

It is the distinctive brand of genuine Armstrong Stocks and Die and Pipe Fitters' Tools.

No "Armstrong pattern" or "just as good as Armstrong" have this stamp. Don't buy anything in this line that hasn't this brand as it is the mark of genuineness.

THE ARMSTRONG MANUFACTURING CO.,
292 Knowton Street, Bridgeport, Conn.

A Certain Sense of Satisfaction



goes with every MERRELL PORTABLE HAND MACHINE, PIPE THREADING and CUTTING MACHINE. We build them that way.

For doing ALL kinds of threading—under ALL conditions—labor trouble and faulty material included—where speed, durability and ease of control count for something, our word to you is to investigate the MERRELL.

Whether it be stationary or portable—hand or power driven—30 DAYS FREE TRIAL must prove conclusively that your choice should be the MERRELL.

This Portable Hand Machine has encased gears, MERRELL standard quick opening and closing die-head, and the latest improved Cutting-off Knife.

Let us tell you more about this machine—The Chasers, Vise and the large range of work covered.

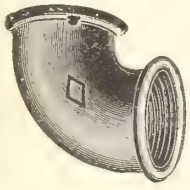
Catalogue for the asking.
Quick shipments.

THE CANADIAN FAIRBANKS CO.
Sole Agents for Canada Limited
MONTREAL, TORONTO, WINNIPEG, VANCOUVER

Tell Me Your Enamelware Wants!

Orders are shipped on the day they're received. Quality right. Price—just what you expect to pay.

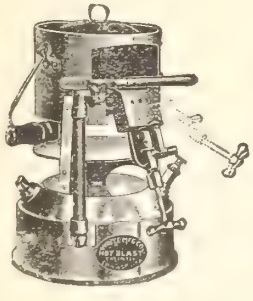
ORLANDO VICKERY
178-180 Victoria Street TORONTO, CANADA



"Diamond" brand Fittings

are incomparable. Then the profit is right. WHOLESALE ONLY.

OSHAWA STEAM & GAS FITTINGS CO., LIMITED
OSHAWA, CANADA



HOTTEST ON EARTH

Our Bonanza Furnaces are known to produce more heat with less fuel than any other make. Jobbers sell at factory prices. Satisfaction guaranteed or money refunded.

No. 38—Price, each, ***$7.80*** net.
No. 39—One size smaller, ***$5.85*** net.

THE TURNER BRASS WORKS
53 MICHIGAN STREET, - - - CHICAGO, U.S.A.

TWO FREE
for every one sent you defective. Isn't that guarantee enough?

Glauber Brass Mfg. Co.
Expert Makers of Fine Brass Goods
CLEVELAND - - OHIO

The Canadian Bronze Powder Works

R. E. THORNE & CO.

The only bronze powder works under the British flag.
High Grade bronze powders and bronze liquids.
Can fill all orders at short notice.

MONTREAL — TORONTO
WORKS AT VALLEYFIELD. *NO ORDER TOO LARGE*

Forwell Foundry Co.

BERLIN, ONT.

Manufacturers of

SOIL PIPE, FITTINGS, and CAST IRON SINKS

Ask Jobbers for "F. F. CO." Brand

Let Our Beaver
Do Your Work.

You Don't Have to
Change Dies.

Cuts 1, 1¼, 1½ and 2″
perfect threads, all
with one set of chasers

The Hand Stock that
Starts Easy and
Finishes Easier.

"The New Way."

You Will Find it a
Sure-enough Beaver.

Write for our special 10-day trial offer

You cannot afford to take the time to thread pipe by hand in any other way.

Other sizes of Beavers will be born soon—¼ to ¾—2½ to 4—4½ to 8—8 to 12.

Manufactured by

Borden=Canadian Company

166 Adelaide Street West, Toronto

Manufacturers who claim perfection for their wares are a plenty. We let the practical men of Canada—**the men who know**—make all the claims which we print regarding the

"Sovereign" Boiler

They—**the men who know**—declare that the Sovereign Boiler is just as near perfect as human ingenuity can make a boiler, and add that it is the nucleus of as perfect a heating system as ever devised by man.

Remember—practical men—men who know the virtues of **The Sovereign System** and reaped the profits, say so. The inference is plain.

TAYLOR - FORBES COMPANY, Limited

Head Office and Works: GUELPH, ONT.

TORONTO—1088 King St. West. **MONTREAL**—122 Craig St. West.
WINNIPEG—The Vulcan Iron Works, Limited

DAISY BOILER

The name Daisy sounds familiar to most steamfitters. Men who to-day are owners of a flourishing business knew the Daisy over twenty years ago when its advent on the Canadian market revolutionized Hot Water Boiler Construction. As the Daisy stood a quarter of a century ago, it stands to-day—the acme of Hot Water heating boilers, the embodiment of simplicity, durability and efficiency.

Daisy

IT IS THE INNER BOILER THAT COUNTS—

A fire pot of ample size to provide for sufficient fuel supply—

Sections so arranged as to prevent direct draught—

Every inch of fire travel backed by water in the hollow sections, thus using to the greatest possible degree the combustible gases.

Write for catalogue and prices.

We carry in stock for your immediate command every size and style of Cast Iron and Malleable Fittings, Brass and Iron Body Valves, Pipe, Tools and Steam Specialties.

CLUFF BROTHERS

LOMBARD STREET, TORONTO

SELLING AGENTS FOR WARDEN KING & SON, Limited

PLUMBER & STEAMFITTER OF CANADA

SUBSCRIPTION : ONE DOLLAR PER YEAR. PUBLICATION OFFICE : 10 FRONT STREET EAST, TORONTO

Vol. I. No. 4. (New Series). MONTREAL, TORONTO, WINNIPEG, MAY 22, 1907. Old Series, Vol. XIX. No. 14

THE DAISY WAY

There is no doubt in our mind that, if a heating apparatus is required at all, it is the intention of the home builder to provide the best that the market affords. It behooves the steamfitter, therefore, to recommend to his customer the boiler that he KNOWS is going to satisfy every requirement that is expected of it.

That means the selection of the DAISY HOT WATER BOILER.

Daisy

FEATURES WORTH TALKING ABOUT

Each section is so arranged that it is practically an independent heater.

The Water Post by which the different sections are connected to the firepot permits any or all sections to be shut off without interfering with the proper functions of the boiler.

Write for Catalogue.

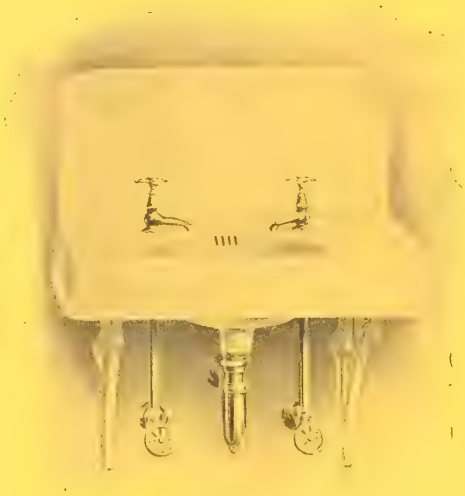
When in the market for steamfitters' supplies of any style or quantity, remember that the contents of the largest warehouse of its kind in Canada are at your disposal.

CLUFF BROTHERS

LOMBARD STREET, TORONTO

SELLING AGENTS FOR WARDEN KING & SONS, Limited

The Merit of Standard Ideal Porcelain Enameled Ware



Porcelain Enameled Lavatory Cast in One Piece

is recognized by the Plumbing and Hardware trade. Standard **Ideal** Ware is of one-piece construction, durable in character and of designs calculated to meet the requirements of the Canadian markets.

Standard Ideal Lines

We manufacture Bath Tubs, Sitz Baths, Shower Baths, Lavatories, Urinal Ranges, Slop Hoppers, Laundry Tubs, Sinks, Closet Ranges, Steamship Supplies, Railway Car Supplies, Hospital Appliances

Porcelain Enameled Sectional Lavatories

The Standard Ideal Company LIMITED

Head Offices and Factories: PORT HOPE, ONT.

SALES OFFICES AND SAMPLE ROOMS:

TORONTO
50 Colborne Street

MONTREAL
128 West Craig Street

WINNIPEG
24 Telfer Block

Low Tank Combinations

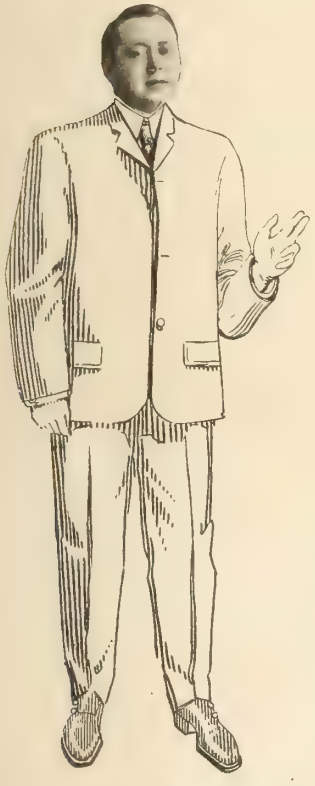
ALL STYLES

BEST ON THE MARKET

PROMPT DELIVERY

SOMERVILLE LIMITED

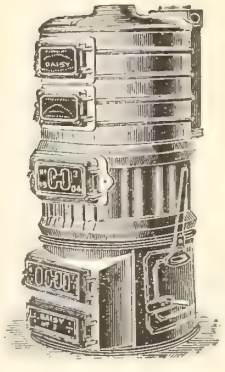
59 RICHMOND STREET EAST - TORONTO



The DAISY Boilers

are built according to the requirements of the most correct and scientific principles. The circulation is positive and rapid. There is more grate and fire surface than seems necessary to carry the listed ratings.

But it is just such business practice that has made the DAISY the most popular boiler in Canada, and has created a greater demand than all other makes combined.



CLUFF BROTHERS

Lombard Street, TORONTO

Selling Agents for WARDEN, KING & SON, Limited

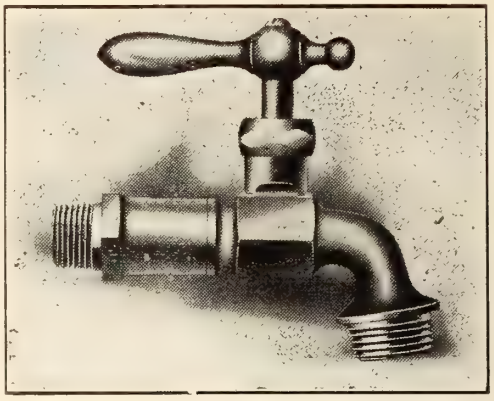
Monarch is "King."

Your Ear Please

Listen to the words of one of our customers:

"I consider the **Monarch Company** make the finest and most up-to-date goods in Canada."

Our Motto: "Nothing too good for Canada."



We manufacture a full line of **Plumbers' Brass Goods, Fuller Work, Compression Work, Quick Opening Hot Water Valves, Etc., Etc.**

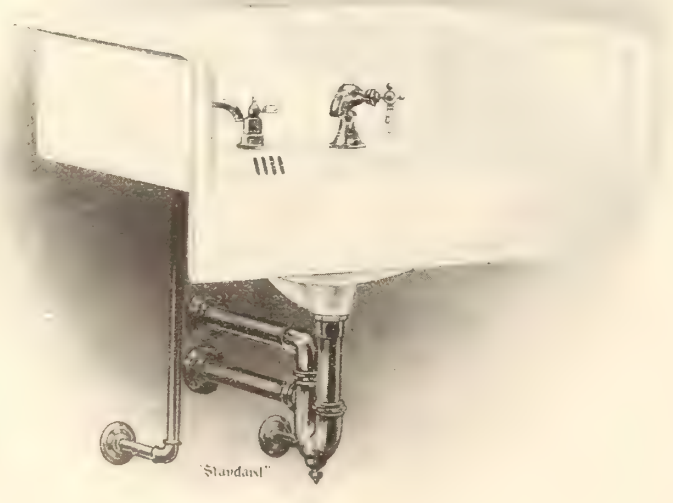
Our goods are time savers because they are fully tested.

Enquiries and orders receive prompt attention.

Monarch Brass Manufacturing Co., Limited

Factory: Port Colborne, - Ont.

Office and Warehouse: 278 Dundas St., - Toronto



"Standard" Plate P. 545 Porcelain Enameled "Recess" Design Lavatory, with Slab, Bowl, Overflow, Back and Ends all in one piece, Nickel-plated "Torrance" pattern Fuller Faucets with China Handles and Indexes, Supply Pipes, Keystone Waste with China Handle and "P" Trap with Waste and Vent to Wall.

Designed for use in Alcoves, Closets and Wardrobes in offices, hotels and other public buildings.

"Standard"

Fixtures in a Place By Themselves.

Our extensive magazine advertising has taught the public to regard **"Standard"** Porcelain Enameling over Iron as a new and superior method in the manufacture of plumbing equipment. Therefore in suggesting **"Standard"** Fixtures for residence or public building you are merely offering the owner what he already considers *the best.*

Standard Sanitary Mfg. Co.

PITTSBURGH, PA.

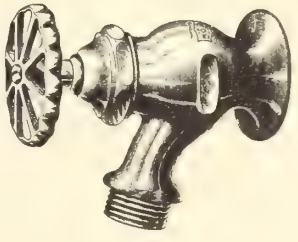
U. S. A.

Babbitt,
Solder,
Lead Pipe,
Etc.

The
Canada Metal Co.
Limited
TORONTO

Mueller Compression Sill Cocks

Body threads engage all the stem threads during compression. Stem will not chatter or work loose on account of premature wear of top threads. Tee or wheel handle or loose key, straight or bent nose.



THE MARK OF DECATUR H⊙M U.S.A. MUELLER GOODS
UNCONDITIONAL GUARANTEE

H. MUELLER MFG. CO.
Decatur, Ill., U.S.A. New York, N.Y., U.S.A.

Advantages of Hot Water Over Steam

C. W. Pomeroy, Architect, St. Louis, Mo., Continues the Discussion on the Application of These Two Systems of Heating Private Residences.

If a customer asked the following question: "What are the advantages of hot water heating over steam heating in a private residence?" I would reply as follows:

I presume that the hot water heating plant is of the kind and system in which there is an automatic self-replenishing expansion tank at the proper elevation, and which is fitted with float and cock and which will admit water to the expansion tank on the dropping of the float below a certain position in the tank, and which will shut off the water upon the approach of the float to a certain position in the tank; also, that the tank is properly connected with the heating portion of the system, by means of suitable size flow and return pipes. The advantages of hot water heating over steam heating in a private residence are, briefly:

First.—Health.

Second.—Greater perfection in connection of piping system.

Third.—Economy in operation.

Fourth.—Dependence being placed upon system when same is operated by incompetent (as far as steam is concerned) servants.

The Health Argument.

It is a recognized fact that a warm or hot and dry atmosphere will quickly cause a headache, and is responsible for a great many other forms of sickness. The absence of such atmosphere is noticed in the use of a hot water heating system, and is present, when the heating system is of the type of steam or hot air heating plants, and many devices, patented or otherwise, have been resorted to to ameliorate the conditions attendant upon the use of steam or hot air, such as in hot air, the use of water pans at or near the fire pot and inside of the air chamber, designed to moisten the air by the evaporation of the water and to carry the same to the different apartments by means of the ascending column of heated air. Also various devices of placing different sizes and shapes of vessels, etc., in each register, which is a great nuisance, and inconvenience, owing to forgetfulness, neglect, inconvenience, destruction of vessel, etc., by rust or other form of destruction, and the cost of replacing, or of cleaning periodically, to avoid destruction and all to moisten the atmosphere.

In the steam plant the water would be placed in vessels and placed on the registers or radiators in each apartment for same reason. The air of a pleasant summer day is charged with a certain per cent. of moisture, and this is enjoyed very much. This is similar to the conditions obtained when using a hot water heating system in winter.

Let there be a hot sun and an absence of moisture, and immediately people say: "My, how hot it is; I wish it would rain." There is the desire for the moisture which is present in the hot water heating system.

Greater Perfection in Piping System.

Better work is required in the connection of the piping for a hot water system than for a steam heating plant for the following reasons:

The idea that better work is required in a hot water heating plant than a steam heating plant is evidenced by the fact that the charge for installing a hot water plant is greater than for a steam heating plant.

Of course it requires more piping, but the better work is required for the reason that, as is admitted, a piping job that is intended for steam, would not do for a hot water heating system, not to mention that there is not pipe enough.

In steam the heat will close any and all small defects and render connections tight, while the cold water will search out the defects and probably leak and cause damage.

The water is cold when it is placed in the system before the fire is started under the boiler, and, therefore, when a supervising engineer wishes to secure the best piece of work that is possible in the shape of a boiler, he gives the most severe test that is known, viz., the cold water test, and to be under such amount of pressure as calculated upon by the engineer to give good, complete and satisfactory test according to the importance of the work, the more important, the higher the pressure, the engineer feeling confident that the cold water will not cause any part to expand and conceal any defect which would afterwards prove to be disastrous and costly, but will find any and all leaks, however small, and any and all other defects.

Economy in Operation.

In the order of economy I would rate the hot water heating plant as first; the steam heating plant as second, and the hot air as third, the latter being the most expensive. However, the fault of the hot air heating system does not lie in the plant itself, but in the manner and the method of installation, and more particularly in the method of the piping, which is installed only with the idea that is required and demanded by competition, which requires that one must eliminate everything possible. "Never mind if the plant does not heat. We have our money, and we can name conditions to make the plant heat properly. If they want the plant installed as it should be, then we want a higher price for our work."

It is quite difficult, if not impossible, to "blow air into a bottle." The bottle is already full of air, and unless some outlet is provided, no more air can enter unless forced. In short, to construct the hot air furnace on the proper and logical plan and method is to reduce the cost of operation.

The steam heating plant is the next most expensive, for the reason that eternal vigilance is the price of safety. Let there be any relaxation in furnishing fuel and the steam gauge will tell the story, the temperature drops at once, and it requires immediate attention, whether automatic or otherwise.

Why Hot Water is Best.

The hot water heating plant, while it costs more to instal, will soon recover the cost for any of the following reasons:

Lack of sickness in the house will, of course, avoid doctors' bills, and less fuel. Ask any housewife, who uses a gas stove, (I mention a gas stove for the reason that the fire can be adjusted to any degree of heat and maintain the same amount of heat). "How low can you turn the flame of your gas stove under a vessel of water after the same has become well heated, and keep the water boiling?" The answer will be, "I can almost put it out."

Just so in the hot water heating plant—you will need no more fuel to start the plant than any other plant and will require less to keep the building warm than with any other system.

One instance was related to the writer, where the gentleman of the house arrived at home one cold winter night about 10.30, and was told that the fire had been out for several hours. He examined the thermometer, and found 60 degrees registered, and then on examining the heater, said that he saw not one spark of fire, the heat having been maintained for several hours after the fire had gone completely out.

As before stated, the hot water plant is the most economical in operation, as the fire can be neglected for several hours and the apartments not become uncomfortable. Let the fire die out under steam and the apartment becomes cool in a short time. Let the fire die out in a hot air plant and the room or apartment becomes cold almost immediately.

Dependence Upon the System.

With the verification of the assumption of the first part of this article, the proposition assumes the position that whereas, it is not always possible for the middle class to secure competent servants, it then becomes needful to endure such aid as rendered by the less competent servants, and it is manifestly unsafe, or possibly I had better say unprofitable, to entrust a steam plant to one who is not competent, and who might neglect to fill the boiler, etc., and thereby burn out one or more sections or get too hot a fire and blow out the safety plug, or let the fire go out and have the boiler freeze up, or in other ways cause damage for the owner.

None of these fit or belong to the hot water heating system, for the reason that a quantity of water, when heated, will retain its heat several hours after the fire has gone out. The filling of the boiler is automatic, and self-regulating, and owing to the open expansion tank, the system is open to the atmosphere and any extra amount of heat in the fire box can do no damage as the steam

can escape at this point and is not confined as in a steam heating plant, which could not be otherwise than closed.

I do not consider that the steam heating plant has any advantage over the hot water heating plant in a private residence, or any other medium-size building. It is quite manifest that the hot water heating plant is far preferable for the reasons given.

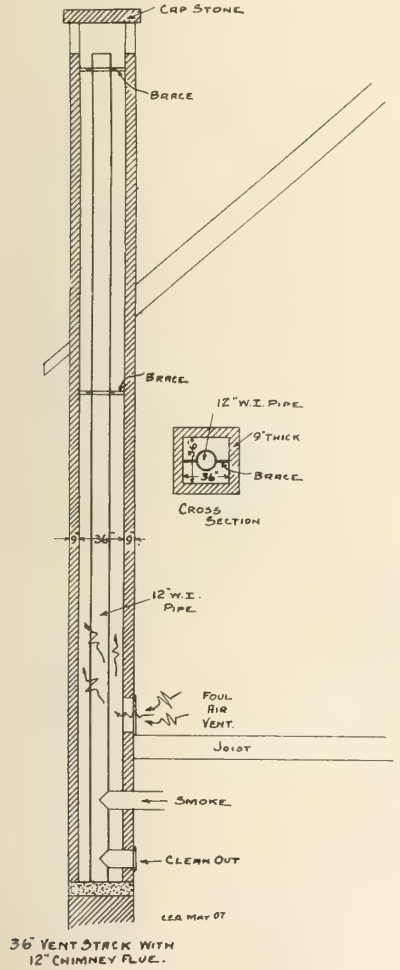
VENT FLUE FOR CHURCH.

R. Thompson, Seagrave, writes: "We are building a church in this place and the committee are anxious to know if they could work out the accompanying plan on chimney. I would be very pleased if you could give anything that would be of use to us; also be good enough to let me know what should be done to make them more telling."

The plan shown and the suggestion as to the changes proposed would not be as satisfactory as desired.

As shown, the vent flue if merged into the chimney would interfere with the draft of the heating apparatus, acting as a check on the same. Even if the two flues are not connected, the volume of air that would be moved through the vent shown would be quite small as the flue is entirely in an outside wall and has only one side exposed to the heat from the chimney flue.

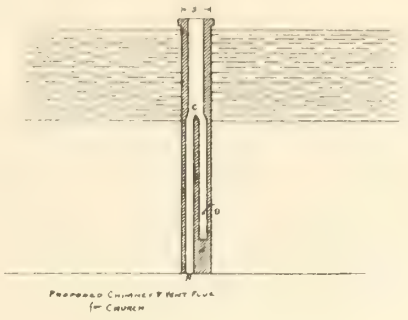
The volume of air moved is dependent



36" VENT STACK WITH 12" CHIMNEY FLUE.

on the difference between the air in the stack and the outside air and the size or area of the vent flue, together with the height of the flue. The greater the difference in temperature and the higher the stack, the higher the velocity, and with any given velocity the volume increases with the area.

As stated, a higher velocity can be


PROPOSED CHIMNEY & VENT FLUE FOR CHURCH

had by increasing the temperature of the air in the out stack. This can be best done by placing the smoke-flue directly inside the vent flue, exposing the entire surface of the smoke flue or stack to the air in the vent flue, as shown in the drawing.

This stack should be built of No. 10 black iron plate and should be anchored each five or eight feet and should rest on a solid base and be provided with a clean-out at the bottom for the removal of soot.

No size is given of the building that it is desired to ventilate, but with the flue as shown (36x36 inches) and a net area of approximately eight square feet, it should be ample to give a change of air four times an hour in a room or building of 25,000 cubic feet. If the building is larger or a more frequent change of air is desired, then the flue will need to be built accordingly.

A register 36 in. x 42 in. should be placed in the vent flue at the floor line of the room. If it should be desired to vent from more than one point several smaller ducts equal in capacity to the main stack could be made of galvanized iron and each inlet provided with a register. A very neat and effective inlet face for the main stack from galvanized iron screen wire of No. 12 gauge having not more than one inch mesh and provided with a suitable frame.

SANITARY HOTEL LAW.

Senator W. H. Barker, of Sparta, Wis., and a prominent member of the United Commercial Travelers of that State, has introduced a bill into the Legislature of his State imposing strict sanitary regulations upon hotels. His bill provides for clean bedding, and for bedding of regulation size to prevent its adjustment in such a way as to come into contact with the breath or saliva of guests. The individual towel is provided for and required to be kept clean, and there are the usual accepted requirements as to the sanitary condition of closets and sinks. Fine and imprisonment are either or both imposed for violations.

IMPROVED HYDRANT VALVE.

A. L. Dow, Lyons, Col., is the inventor of an improvement which will be of particular value around hydrant-valves, which are usually so located that it is very difficult to get at the valve to repair it. The invention pertains more particularly to improvements in hydrant valves whereby the valve and valve seat may be removed from the casing without disconnecting the latter, should it become necessary to repair or replace any working parts.

WATERPROOF PORTLAND CEMENT

Dissolve (I). 10 parts of mastic in 60 parts of anhydrous (absolute) alcohol, (II). 20 parts of isinglass in 100 parts of water and 10 parts of grain spirit, (III). 5 parts of gum ammoniac in 25 parts of grain spirit. Thoroughly mix solutions I and II and then add solution III and boil the whole down to 180 parts.

ADVANCED LEGISLATION.

The township of Cicero, Illinois, has recently passed a new plumbing ordinance under which it will be compulsory for all master plumbers and journeymen working at the trade in Cicero to secure a certificate and pass an examination as to their competency in accordance with the State law. The ordinance is patterned mainly from the Chicago Plumbing Ordinance, with such minor changes as will be suitable for a small town. The village board has also passed a sewer ordinance which requires a $10,000 license fee and a bond of $3,000 for anyone engaging in business as a sewer builder. Master plumbers are also required to file a bond of $3,000.

GAS AND AIR BURNER.

Patents have been secured by D. Cooley, Galena, Kan., for a new gas and air burner. This burner is designed for use in heaters, furnaces, and the like, arranged to cause a thorough mixing of the gas and air previous to ignition, thus insuring complete combustion. Regulation of the supply of gas and air according to the richness of the gas is also permitted by the arrangement.

OUTLET BOXES AND ELECTRIC WIRING.

It will be interesting to electricians, builders and architects to know that at the recent electrical convention held in New York, that it was recommended that outlet boxes be used on all electric wiring. The underwriters state that notice is being forwarded to all parties interested that they will be called for immediately. These boxes will reduce the hazard from canopy fires and greatly facilitate the installation of electric fixtures.

SANITARY OUTLET.

An invention by P. F. Guthrie and J. Hayes, Nutley, N.J., provides a very sanitary outlet for bath tubs, basins, etc. The outlet is arranged to insure a free outflow of the water from the tub, basin or like fixture without danger to the outflowing water becoming air-bound; the invention also prevents foul air rising in the outlet and contaminating the air of the room in which the fixture is located.

PLUMBER AND STEAMFITTER
OF CANADA

The MacLean Publishing Co.
Limited

JOHN BAYNE MacLEAN - - - President
W. L. EDMONDS - - - - Vice-President
H. T. HUNTER - - - Business Manager
WESTON WRIGLEY - - - Managing Editor

Publishers of Trade Newspapers which circulate in the Provinces of British Columbia Alberta, Saskatchewan, Manitoba, Ontario, Quebec Nova Scotia New Brunswick, P. E. Island and Newfoundland

OFFICES

MONTREAL - - - - - - 232 McGill Street
Telephone Main 1525
TORONTO - - - - - - 10 Front Street East
Telephones Main 2701 and 2702
WINNIPEG - - - - 511 Union Bank Building
Telephone 3726
LONDON, ENG. - - - - - 88 Fleet Street, E.C.
J. Meredith McKim
Telephone, Central 12960

BRANCHES:

CHICAGO, ILL. - - - - - 1001 Teutonic Bldg.
J. Roland Kay
PARIS, FRANCE - Agence Havas, 8 Place de la Bourse
MANCHESTER, ENG. - - - 92 Market Street
ZURICH, SWITZERLAND - - - Louis Wolf
Orell Fussli & Co.

Subscription, Canada and United States, $1 00
Published Twice Every Month
Cable Address { Adscript, London
{ Adscript, Canada

KEEP THE DISCUSSION GOING.

The discussion on the "Advantages of Hot Water Over Steam" has excited widespread interest and from different points in Nova Scotia, Ontario and western Canada requests have come for copies of the papers containing the first contributions.

The article by Mr. Pomeroy, published this week, was received in a peculiar manner. The Plumber and Steamfitter offered a prize of a copy of "Principles and Practice of Plumbing" for the best contribution to the recent competition on this subject. This was taken as a compliment by the Standard Sanitary Mfg. Co., Pittsburg, the publishers of the book, and they circulated a copy of our offer throughout the United States. Mr. Pomeroy got busy, but the prize had already been awarded to "G. S.," London, Ont.

The St. Louis architect's article will be read with interest by Canadian readers of this paper, and undoubtedly many will like to write a short contribution, to keep the discussion going.

We invite Canadian heating contractors and architects to express their views on this subject. Every contributor cannot get a valuable book as a reward, but everyone can gain by the discussion and those who want the book can get it at a reasonable price from the publishers of this paper.

SOME IDEAS WANTED.

In the last issue of The Plumber and Steamfitter we urged that steps be taken to reorganize the Ontario Master Plumber's Association.

Ben Noble, of London, as vice-president for Ontario in the National Association is really the one responsible for calling such a convention, and in conversation with the Editor last week he said he would be only too willing to take the initiative if he is made certain that reorganization is desired. He further contends that some definite ideas regarding organization should be submitted to him before the call is issued so that the convention will have something definite to work upon once it gets together.

The points are well taken. Let those in the trade who desire a provincial association write Mr. Noble, expressing their ideas and making such suggestions as will be helpful to him in the work of reorganization.

LABOR TROUBLES.

Toronto, Hamilton and London are all experiencing a strike of journeymen plumbers, with honors about even so far. Some of the smaller firms and a few of the larger ones have compromised with the union men but with hardly an exception all the large employers are standing firm with a determination to win or go out of business.

Where employers have given in they are picking their men and paying the high wages only to those who are capable of earning the money. The employers contend that there has been altogether too much loafing done and there are many other matters to fight over besides the wages. No objection will be made to paying the highest wages asked if competent work is given in return.

The contest has practically resolved itself into a battle for the control of the shops. The union, by limiting the number of apprentices, by laying back on their work, and by other obnoxious rules, have practically secured a dominating position and employers have found themselves unable to discipline employes who have damaged large quantities of materials through rank carelessness. This has run its limit, the bosses say, and the "open shop" is the only alternative to handing their keys over to the union.

The unionists in Toronto played a trump card by reducing their prohibitive $50 membership fee to $2 during the strike, enrolling, as a result, nearly 100 English "bronchos" who refused to pay the exhorbitant fee. This left the bosses almost completely tied up, but it also put more men out of work and will provide a larger supply of men when the trouble is over and work has been resumed. The action is also causing dissatisfaction among the men who have paid the $50 fee and are given equal privileges to those who only paid $2 for membership.

As we go to press the employers are standing firm and a long strike seems likely to result.

ON THE GROUND FLOOR.

Canada has reached a stage in her development when opportunities are most favorable for the establishment of industries, which will in years to come be regarded as of foremost importance. In metaphorical language, the national structure has risen above the foundation and basement stages to the ground floor. The door of opportunity stands open, affording an easy entrance to all who seek admission.

If we may consider the development of Canada to be in any degree analogous to that of the United States, it is apparent that the firms, which make a good start in the years of early development, will be the strong ones when the country comes to maturity. In the case of Canada, her growth will be even more rapid than that of the United States, for the reason that we, in this country, are able to benefit from the experience of the Republic. In knowledge, if not in experience, we stand to-day her equal.

The importance of getting in on the ground floor must not be minimized. In coming years, certain work must be done. The firms which will do this work will undoubtedly be those that have shown by past accomplishment their ability to perform it. New industrial concerns may be called into being as the years go by and as the exigencies of the situation demand, but none the less is it true that the old-established firms, when properly managed, will enjoy a favor not accorded to less experienced competitors.

Industrial concerns outside Canada can share in Canadian business as well. For many years to come it will be impossible for this country to supply its own needs, and we would reiterate our advice that it is important to get in on the ground floor. By watching this market carefully, by constant advertising in the best mediums and by personal canvass on occasion, this purpose can well be accomplished.

A pawned opportunity is seldom redeemed.

A PROBLEM FOR DISCUSSION

The sketch shown below illustrates a boiler and four radiators, two of the latter containing 32 square feet, and the other two 48 square feet each.

Could these radiators be made to work properly with one main and return, or would it be necessary to have two mains and two returns, one pair for each floor?

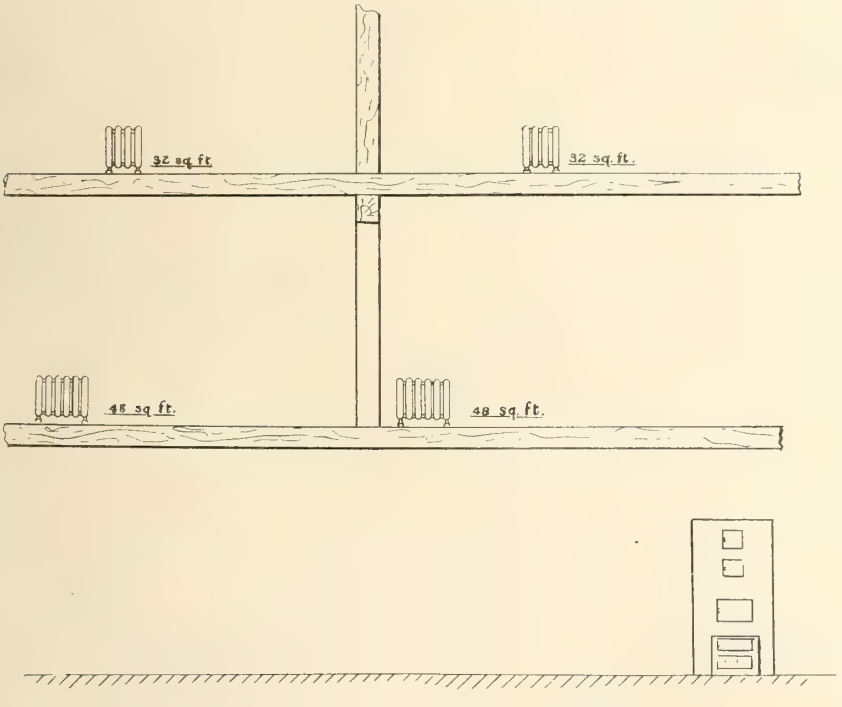
Indicate by a rough sketch how you would pipe from a boiler to these four radiators and also give a list of the tees required.

The problem outlined above provides a subject for an interesting discussion. The editor invites letters of from 200 to 500 words in answer to the question and offers to the sender of each letter accepted for publication a year's subscription to The Plumber and Steamfitter. In order to be accepted each letter must be accompanied by a rough sketch showing the plan of the piping.

Forward your contribution at once if you desire to come in under the above offer.

JUDICIOUS BUYING.

"Thought—vigorous, careful, penetrating thought—is the surest and safest means of avoiding the shoals and breakers upon the great sea of life," says a writer in an exchange. Careful consideration and planning is indispensable to the successful business man. Especially is it necessary for the business man to carefully consider what kind of goods he stocks his store with and where he gets them. Too many merchants have found their stores stocked with unseasonable and unsaleable goods owing to a lack of careful consideration when procuring them. The thoughtless merchant is no more secure from disaster than the thoughtless railroad engineer. He must look ahead and govern himself accordingly.



How Should the Piping for this Job be Planned?

The first and most important thing to take into consideration when buying goods is that quality or character in them which make them saleable or desirable. Selection should be made of the goods which will sell readily, and which, when sold, will produce a good profit. Then, having settled this part of the purchasing act, the prices should be looked after.

The surest way of hitting upon the right price for goods is to be inquisitive. By drawing all the information possible from travelers, by inquiring of and comparing prices and by being provided with catalogues and price lists from every source possible, the dealer should be enabled to settle upon an equitable and profitable price for his goods.

The matter of knowing when to buy is very important. The business man who gauges to a nicety the time to buy goods will be the successful seller. By a careful study of the market and of the demand this can be easily attained. Therefore, consider carefully and act promptly.

Section of Main Show Room of the James Robertson Co's Montreal Headquarters.

A BEAUTIFUL SHOWROOM.

The accompanying photograph illustrates a section of the main showroom of the James Robertson Company, Montreal, wholesale dealers in plumbers' and steamfitters' supplies.

The policy of the company has always been to do things thoroughly and the illustration shows what an up-to-date firm can do to show off their wares to advantage.

APPLICATION OF HEAT UNIT TO BUILDINGS

Address by Geo. G. Bennett before the Ohio Society Mechanical, Electric and Steam Engineers.

When estimating the heat required for the warming of buildings, the following methods may be used. Determine the loss in heat units through the walls and windows and make some allowance for the loss of heat by leakage of cold air, due to the faulty construction of the room or building. The total loss in heat units for the entire building is found by the following method, which will be found to give a very close approximation. It has been determined by practical experiment that the loss in heat units through the change of air in the room or building, caused by bad construction when not otherwise ventilated, is about 1.430 heat units per square foot of surface per hour. It will require 0.238 heat units to raise one cubic foot of air one degree from absolute zero, but we are only figuring on zero on the Fehrenheit scale, and the specific heat of air at this temperature is 0.0864; therefore, to find the loss in heat units, we must multiply 0.236 by 0.0864, which equals 0.0205. Now, this is equal to the loss of heat in one cubic foot for one hour for each degree difference of temperature, and the room or building must be heated to 70 degrees, with an outside temperature of zero. To find the total loss we must multiply 0.0205 by 70 degrees, which equal 1.439 heat units for one hour.

Outside walls will require 0.223 heat units per hour per degree difference of temperature between the inside and outside temperatures. The difference is 70 degreess, which, multiplied by 0.223, equals 15.61 heat units, which gives the loss for one square foot for one hour. The next operation is to find the loss in heat units through one square foot of glass. The glass being the coldest part of the building, it requires a greater number of heat units ta counteract the cooling effect of the outside temperature. The glass will lose 0.543 heat units per hour per degree of difference of temperature. Now, as in the former example, the difference between the inside and outside temperatures is 70 degrees, and 0.543 multiplied by 70 degrees equals 38.01 heat units, which is the loss for one square foot of glass. The total loss per hour will be about as follows:

	Heat Units
Loss for 1 cubic foot of air	14.39
Loss for 1 sq. ft. of outside wall	15.61
Loss for 1 sq. ft. of glass	38.01
Total	55.059

I will now give a practical example of the above methods of determining the amount of radiation for a given sized room. The room is 16 ft. square by 10 ft. high, and has four windows containing 32 square feet of glass each. The total number of heat units necessary to counteract the cooling effect of glass, outside walls and cubical contents is as follows:

For the cubical contents we have 16 x 16 x 10—2,560 cubic feet, which is the cubical contents. This, multiplied by 1.439 equals 3,683.84, the heat units. The square feet of outside wall equals 16 x 10 x 2—320, and this multiplied by 15.61 equals 4.995.20 heat units lost through the outside walls. The square feet of glass equals 32 x 4—128, and this multiplied by 38.01—4.864 heat units lost through the glass.

The total amount is equal to:

	Heat Units
Cubical contents	3,683.840
Outside wall	4,995.20
Glass.	4,864
Total....	13,542

The total loss in heat units for the above room is now represented by 13,-542.04.

The number of square feet of pipe or other radiating surface that will be needed to counteract this loss is determined by the aid of the difference between the temperature of the steam pipe and the temperature at which the room is kept. We will assume the temperature of the steam to be 228 degrees —5 pounds gauge pressure. The difference between the temperature of the steam pipe and the temperature of the room will be the number of heat units given off in the room. The room is to be kept at 70 degrees, then 228—70—158 heat units—i.e., each square foot of heating surface will give off to the air in the room 158 heat units, so if we divide 13,542 by 158 the quotient will be the square feet of pipe or radiating surface, which is equal to 85.7.

If it is desired to heat the same room by hot water the process is somewhat similar, with the exception that the temperature of the water will be considerably less than that of the steam, so that the square feet of heating surface will be increased that much. In hot water heating the temperature of the water very rarely gets above 180 degrees, and it will be found safer to estimate the temperature of the water at about 140 degrees. If the outside temperature should get below zero the temperature of the water could be raised to 180 or 200 degrees.

TORONTO PLUMBERS' STRIKE.

Just one week ago, upon the termination of the old agreemeot between the journeymen and the Toronto master plumbers, 460 union plumbers laid down their tools and refused to continue work under the old scale of wages. Since then both sides have remained most obdurate as to their respective contentions and the outlook is fair for a prolonged hold-up in the plumbing trade.

The demands of the union men are as follows: An eight-hour day and off at noon on Saturday; time and a half for Saturday afternoon and double time for holidays; wages to be paid weekly before 12.15 o'clock on Friday; all grievances to be settled by a committee from each side. The journeymen demand in the new agreement they have submitted a minimum wage of 45c. per hour, which is a raise of 7½c. over the present scale. The much-talked-of apprentice clause, which the employers claim is so unreasonable, reads:

"No apprentice shall be allowed a kit of tools until he has served three years in the city of Toronto, and not until he has passed an examination. Five years shall be deemed the term of apprenticeship, at the end of which time all apprentices shall pass an examination and shall not be rated as journeymen until they pass their final examination. All examinations shall be before the examining board mutually agreed upon by both parties to this agreement. All apprentices to be paid not less than $8.50 per week in their fourth year and $12.50 in their fifth year."

Thus, according to the employers, a boy who had served four years in Montreal would have to serve another three years in Toronto, which would make his apprenticeship last seven years instead of five.

Mr. Merrick, secretary of the Employers' Association, claims that the actual wage earned by journeymen now ranges from 40c. to 45c. and that the demand of a minimum wage of 45c. is entirely unreasonable and that present conditions of the trade do not warrant this concession to the men.

Mr. Merrick has issued authentic figures taken for the individuals employed by five leading plumbing establishments in Toronto, which figures can be verified by reference to the books of these firms. He shows that the wages received at present by journeymen plumbers run roughly from $900 to $1,100 per annum and this, if reckoned out on the basis of the ten hour day, which obtains in most of the other trades in Canada, would bring a journeyman's salary up to between $1,300 and $1,400 a year.

However, both sides have their contentions and it is plainly a fight to the finish. The employes certainly made a politic move when they reduced the fifty-dollar fee to join the union to a nominal one of $2. Since then many of the English journeymen have joined the union and the employers have been, consequently, partially robbed of this source of strength.

Forty per cent. of the shops affected belong to the Employers' Association and include the largest shops in the city. These firms employ fully 85 per cent. of the members of the union. Many of the smaller employers have signed the men's agreement, but the only firm of any size to do so is W. Mashinter & Co., which, however, does not belong to the association.

At present both sides are firm and both claim to be able to withstand a long struggle. The members of the Employers' Association have all signed an agreement to keep open shop and not to agree to discharge any men taken on now in case of a settlement with the union.

While the strike lasts members of the union (excepting the Englishmen) will receive $5 per week from the international body, and the local union also boasts of an extensive fund. The strike nineteen years ago lasted four months, and the present outlook has even a more foreboding aspect. At any rate, Toronto is now in the throes of a plumbing strike which, if protracted, is likely to involve the city in widespread unsanitary conditions and considerable disease.

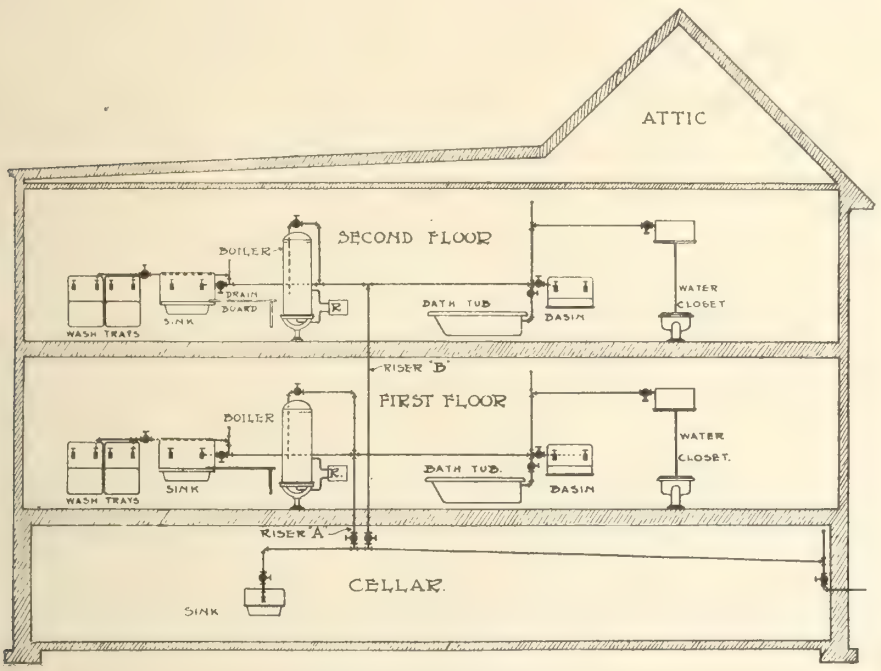
THE PLUMBING OF A COTTAGE

By J. A. F. Cardiff in the National Builder, Chicago

Water Supply.

The illustration herewith is a plumbing section showing a system of piping for the supply and distribution of cold water for a two-family house, with the usual number of fixtures, the source of supply being the city water main in the street.

The material of piping and fittings is "extra strong" iron pipe, galvanized both inside and outside, except the service connection, which is of "AA" lead pipe. Joints are screwed in red lead, after the burr formed by cutting is carefully reamed out. Lead is used for the service connection only because of its flexibility, as described in the preceding number. Although at one time lead was commonly used for the entire water supply system, its use is now condemned owing to the large amount of lead which



Piping for House Water System.

the water dissolves, frequently causing lead poisoning. This amount varies according to the kind of water and the length of time it stands in the pipe and is greatest when the water is "soft" and allowed to stand for any length of time.

Galvanized iron pipe is fast supplanting lead pipe and is much cheaper and better. While water dissolves the zinc enough to be a little objectionable, the zinc is rarely present in sufficient quantities to be injurious. Water causes plain iron pipe to rust and this imparts an objectionable taste to the water and makes it unfit for washing, but the rust is not injurious to health.

The only pipes which are unaffected by the action of water, and therefore the best to use, are Benedict nickel seamless tubing, tin-lined iron and tin-lined lead. These are considerably more expensive than either the galvanized iron or lead pipe, but give perfect surety from metal poisoning.

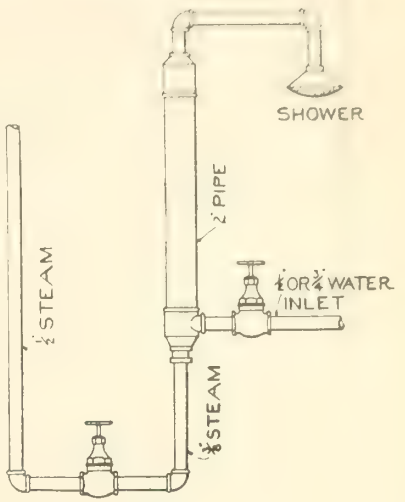
Considering the piping arrangement of the house in detail we start with the service connection which, after it passes through the front cellar wall, is fitted with a globe valve to shut off the water from the entire house. This valve has also a drip so that when shut off it will empty all the pipes within the building and to this end all of the pipes should be graded so that the water will flow to this drip.

Two risers are taken off the main supply pipe, one for each floor, and are valved at the base so that the supply to either floor may be shut off and the pipes emptied. It is quite important that an independent riser be provided for each apartment so that they may be controlled separately. It greatly facilitates repairs and permits of emptying the system whenever an apartment is vacant, without cutting off the supply to the other apartment. This is very frequently necessary in order to prevent the water in the pipes from freezing when there is a vacancy in cold weather.

The installation in other respects is no different than the examples shown in preceding numbers, except that the supply to a hot water boiler is shown for the first time. This branch should enter the top of the boiler and should extend down into same to a point a couple of inches above the waterback of the range, which is indicated by "r" in the cut. In this way enough water will stay in the boiler to keep range waterbacks full, after the water has been emptied from the rest of the system. When it is desired to empty the boiler and waterback entirely the water may be drawn off through a waste cock provided at the bottom of the boiler.

ANOTHER SHOP SHOWER-BATH.

In a recent issue of the Valve World a good description was given of a shower-bath and water heater specially adapted to shops where steam is available. James W. Cordiner, of Laramie,



A Shop Shower Bath.

Wyo., considers that he has a simple contrivance which he illustrates in the accompanying cut. Mr. Cordiner made his apparatus some years ago. His objection to the appliance illustrated in The Plumber and Steamfitter of March 13 is that he believes the steam coming in against the water would cause hammering. The device he contrived, he claims, does not hammer, and works something like an injector.

EMPIRE BRASS MAY MOVE.

The Empire Brass Manufacturing Company, London, may remove from that city over a very trifling matter. Recently, the company, finding its premises on Talbot Street too small for the requirements of its growing business, purchased a site just outside the eastern boundary of the city, where it proposed to erect an immense factory. In order to secure sewer accommodation the company requested the city to lower the sewer which is now used by the Canada Packing Company, whose premises are located east of the Empire Company's new site. The city council was willing but the city solicitor pointed out that the city has no power to spend money outside the city limits. The council decided to seek legislative sanction to the annexation of the district, but as the law now provides that the consent of the ratepayers must first be obtained, the prospects of amalgamation are not very encouraging. Berlin, Port Hope, Brantford and Hamilton have made bids for the concern, and it is quite possible that the company, which employs between 100 and 200 hands, will move elsewhere unless some way of overcoming legal objections can be found. The cost of lowering the sewer would be a very small matter.

TESTING PLUMBING FOR LEAKS

A. S. Atkinson, in Engineering Review.

Efficient tests of plumbing are of important value either in a new system or an old one. No plumber should consider his work complete until thorough tests have been made to see that all possible defects are sealed up. Relying upon his ability to do first-class work, a plumber may regard rigid testing unnecessary, but there are too many possible chances for slight defects developing in the system, even when under constant supervision, to warrant one in risking his reputation without testing. In new plumbing in towns and cities inspection is generally made by sanitary plumbers appointed by the municipal authorities, and most plumbers make tests before the work is declared finished. In the country house, however, there is less inspection of the work, and the plumber who installs the system is the final arbiter of his work unless the architect or builder insists upon a final test.

The "roughing test" should be made after the soil piping has been put in. Failure to make this test may cause endless trouble and delay, not to speak of expense later. Where the defects are in the connections of the soil pipe, the final test may prove puzzling and difficult. Before the roughing test is made all waste and vent connections should be made. All the openings in the soil piping should be closed with expansion plugs. This should include the fresh air inlet, rain leaders, cellar drainage trap, and the waste and vent connections. The upper ends of the pipes leading to the roof may be left open, for in the water test there will be no trouble with these.

Testing in Cold Weather.

In the mild seasons of the year the water test is the simplest and most efficient, but in very cold Winter weather there is a danger of the water freezing in the pipes. The danger of bursting the pipes or the soil pipe hubs is sometimes quite great even after the water has been drained off at the close of the test. This is due to the fact that the oakum at the bottom of the joints gets water-soaked, and the water freezing causes such expansion that the hubs are broken.

When it is necessary to test the plumbing in the rough stage during exceedingly cold weather, the pneumatic test may give fairly good results. This is not so thorough or as satisfactory as the water test, but it is free from any danger of freezing and bursting pipes or hubs. If one has the necessary equipment handy for the pneumatic test, such as air pump and air gauge attachment, this may be used in very cold weather to ascertain if there are any leaks. When the air is pumped into the sealed system up to the required pressure registered by the gauge, any leakage will show by a drop in the gauge. If no such leak shows it is not necessary to try the water test. In this way the pneumatic test often proves of great advantage in cold weather.

Should a leak develop as registered by the gauge, the work of finding it is a problem which in some cases proves almost insurmountable. The trouble of locating these defects is the greatest drawback to the pneumatic test. In many cases expert plumbers simply use the air test, and then, if serious leaks show, they immediately apply the water test, preferring to make sure with this without delay. In a good many cases the pneumatic test is sufficient, and the "roughing test" ends with it.

The Water Test.

The water test is more certain and thorough. A plumbing system which can stand this test where the building is pretty high is certainly a good one. The pressure on the soil pipes and the lower part of the plumbing is considerable, frequently sufficient to blow out the plugs. The usual method is to pass the water into the system until it rises to the top of the pipes on the roof. The water is left to stand in the pipes for several hours, so that it can soak through the oakum and work its way through any sand holes in perfect joints or split fittings. Frequently a leak will not show itself until the end of two or more hours, especially in the upper stories. If the water is withdrawn after an hour a defect may thus be present and become enlarged after a few days or weeks, so that expensive repairs will be necessary. In very high houses the water test sometimes proves unnecessarily severe, and parts of the lower piping may actually be strained by the high pressure. Plugs are apt to be blown out, and sometimes the damage is quite sufficient to cause a good deal of expense in repairing. It is better in such cases to test a part of the system at a time, so that the pressure will be lessened by a reduction in the quantity of water used. In all cases the roughing test is applied before the plastering and finishing have been made in the house. If left until after the plasterers have finished or even begun their work a serious leak might cause considerable damage. The chief object of this first test is to locate defects before they can cause damage. If the water test is applied early enough any bursting of a joint or serious leak could do very little harm.

There is quite a variety of testing plugs in use. Most of them are satisfactory in ordinary tests, but where a severe pressure of water is going to be applied it is well to make sure that the best plugs are obtained. Their attachment to the different pipe openings should be made with care to prevent blowing out. Wooden plugs are used successfully in many country districts, but if the pressure is a heavy one they are not very desirable. It is difficult to keep them tight, and if one works loose the water will inundate the cellar and lower stories of the house. The failure of the test means that the work must be done all over again, and the water accumulated in the cellar must be pumped out. All of which simply increases cost and labor. Watertight metal plugs, with a rubber ring, are applied by a nut, which screws tight to the opening, and such plugs will withstand any pressure applied by the water test. Where a lead job is done, the ends of the pipes are most frequently beaten together and soldered, thus doing away with plugs entirely for this part of the work. Where wrought iron pipes are used the ends are capped in the ordinary method. This makes the ends practically watertight and prevents any danger of blowing out of plugs.

When leaks and defects develop under the water test the question of repairing them is one that calls for good judgment on the part of the plumber. In too many cases patching up is considered sufficient, and many a poor job has been left in this condition. When an imperfect length of pipe and fittings is discovered, there is obviously only one honest course to pursue. It should be removed and replaced by a new one. This is not the cheapest method, and a good many will hesitate to do it; but for the sake of a reputation and in the interests of honest work it should be done. It is possible to patch up such imperfect pipes and fittings so that leaks would not show for many months or possibly a year, but eventually the trouble would come out. Now it is an expensive job to remove pipe fittings, and to avoid this every length should be carefully inspected before put in. A little examination of the pipes at the beginning might save a good deal of trouble and expense later. Any piece that appears imperfect should be laid aside for future examination. Imperfect lead joints, of course, can easily be tightened by caulking. The repairs, however, should be made until there is absolutely no defect apparent. The whole length of the lead pipes and the joints should be examined carefully for sand holes and imperfect soldering at joints and attachments. The pressure of the water having determined the condition of all pipes and joints to be sound and perfect, the work of plastering can be taken up by the builders, and the plumber can make final preparations for attaching all fixtures. The roughing-in test has shown that the pipes are perfect, but the final test or "finishing" should indicate the satisfactory condition of the fixtures and their attachments. In the hands of a skilful plumber these attachments and fittings should be made practically watertight, but accidents may sometimes prevent the best kind of work. Allowances must be made for a variety of accidents, and it is never safe to accept the plumbing without the final test.

The peppermint test for the finishing is not as satisfactory as the smoke test, for the same reason that the pneumatic test is less desirable than the water test in the initial stage of in-

stallation. It is almost as difficult to locate a leak with peppermint as with air. The leak may be manifested by the pungent odor, but its exact location is often impossible to find except by hours of hard work. Any test that makes the location of the trouble uncertain can never attain the highest degree of satisfaction. The smoke test is far more satisfactory. With this the leak is located exactly, and the escape of smoke from any of the plugged openings cannot render the test worthless. The escaping smoke can be located by the eyes, which is far more satisfactory. All openings are plugged securely for the smoke test except the one through which the smoke is admitted. To test with smoke a machine should be used specially designed for the purpose.

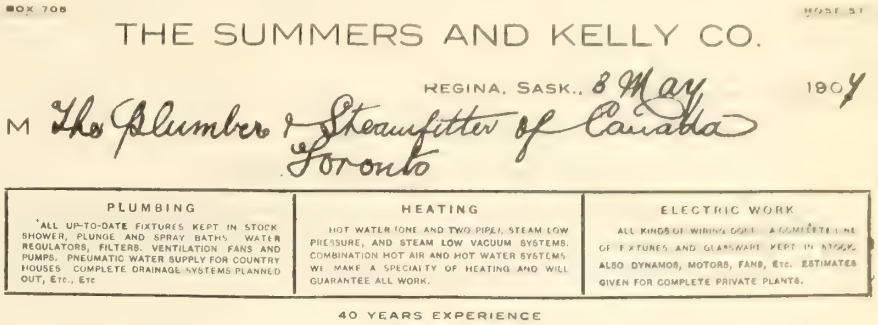
A LIVE WESTERN FIRM.

The fine looking lot of men shown in the accompanying engraving are the employes of the Summer & Kelly Co., Regina, one of the largest and best known plumbing and heating firms in Western Canada.

As will be seen by their novel letterhead, reproduced in another illustration, the firm has had 40 years of experience and the work of building up their large business has, therefore, been not the labor of a day. The novel form of the letterhead is worthy of being copied by many plumbing firms, too many of whom follow the simple and unoriginal forms of bygone days. Many use stereotyped cuts to indicate the nature of their business. This is better than a plain form but, in the editor's opinion, Summers & Kelly have, in their concise and comprehensive paragraphs, gotten out a letterhead form in plain style which should impress favorably every customer and correspondent.

Summers & Kelly have a good field for work at Regina as since the establishment of the Province of Saskatchewan, trade has been brisk and many large public buildings, hotels, etc., have been erected. Summers & Kelly have secured their share of this business, a few of their recent contracts including the plumbing and heating in the Regina city hall, Wascana Hotel, Michaelis business block, Armour's new block, Bank of Montreal at Regina, and also a new building for the same bank at Indian Head. A description of the city hall job is promised readers of The Plumber and Steamfitter in an early issue.

Photograph of the Members of the Firm and Employees of the Summers & Kelly Company at Regina, Sask.


BOX 708

THE SUMMERS AND KELLY CO.

REGINA, SASK., 8 May 1904

M The Plumber & Steamfitter of Canada
Toronto

PLUMBING	HEATING	ELECTRIC WORK
ALL UP-TO-DATE FIXTURES KEPT IN STOCK SHOWER, PLUNGE AND SPRAY BATHS WATER REGULATORS, FILTERS, VENTILATION FANS AND PUMPS. PNEUMATIC WATER SUPPLY FOR COUNTRY HOUSES. COMPLETE DRAINAGE SYSTEMS PLANNED OUT, Etc., Etc	HOT WATER (ONE AND TWO PIPE), STEAM (LOW PRESSURE, AND STEAM LOW VACUUM SYSTEMS. COMBINATION HOT AIR AND HOT WATER SYSTEMS. WE MAKE A SPECIALTY OF HEATING AND WILL GUARANTEE ALL WORK.	ALL KINDS OF WIRING DONE. A COMPLETE LINE OF FIXTURES AND GLASSWARE KEPT IN STOCK. ALSO DYNAMOS, MOTORS, FANS, Etc. ESTIMATES GIVEN FOR COMPLETE PRIVATE PLANTS.

40 YEARS EXPERIENCE

Letterhead Used by the Summers & Kelly Company, Regina, Sask.

NEW BEAVER DIE STOCK.

One of the most interesting die stocks that have been put on the market in recent years is the "Beaver" Easy Worker which is attracting considerable attention because it solves successfully the problem of threading four sizes of pipe 1 inch to 2 inches with a single set of chasers, thus saving the time and trouble of changing dies. It is built on the easy working principle with narrow chasers, which gradually recede while threading to form the taper thread, and one can thread 2-inch pipe with one hand. The teeth in the chasers are so formed that the first tooth removes only a portion of the metal and each succeeding tooth cuts a little deeper, so that the work of cutting is equally distributed over all the teeth, thus requiring less frequent grinding. The dies are set to any size pipe by simply shifting the cam lever and can be likewise set over or under standard to meet the variations in fittings and the construction is such that the dies cannot slip. A very clever feature of this stock is a tension screw collar which holds the chasers down tight in perfect alignment, preventing chips from working in and takes up any looseness or future wear so that it cannot strip threads.

This stock is patented and manufactured by the Borden-Canadian Company, Toronto, and in a very neat booklet they set forth its advantages and undoubtedly the distinct feature of not having to change dies will make it very popular as a time saver.

WOLVERINE BRASS IN CANADA.

An agreement was recently concluded between the city council and Louis A. and Harold C. Cornelius, representing the Wolverine Brass Company, of Grand Rapids, Mich., for the establishment in this city of a Canadian branch of that concern, to be known as the Canadian Wolverine Brass Company, Limited. The company manufacture brass goods of all kinds, including plumbers' supplies, gas fittings, etc. The city agrees to loan the company $20,000, repayable in 20 annual instalments of $1,000 each, with interest at 4 per cent. The concern will have a paid-up capital of $30,000, and will spend $32,000 on the site, factory and plant. The company agrees to employ 25 men all the year round from the start.

WESTERN BUSINESS CHANGE.

Arthur Desmarchais, who has been in charge of the plumbing and heating department of Carter Bros.' business at Picton, Ont., called at the Toronto office of Plumber and Steamfitter last week. Mr. Desmarchais has the western fever and is on his way to Red Deer, Alberta, to take charge of the plumbing and heating department of Illsey Bros., W. J. Illsey, of the J. H. Ashdown Company, Winnipeg, having purchased the interests of Mr. Stephenson in the Stephenson & Illsey business. Mr. Desmarchais carries with him a splendid testimonial from his late employers and success is assured him in his new location. W. J. Illsey will not remove to Red Deer until the fall.

NEWS OF THE TRADE IN CANADA

Thomas Bleasdale, London, has closed his plumbing shop.

Proulx & Chartre, plumbers, Montreal, have commenced business.

W. A. Ford, plumber, is removing from Leamington to Walkerville.

J. Champagne & Bros., plumbers, Montreal, have commenced business.

F. Wallis, Toronto, has moved from 345 College Street, to 497 Yonge St.

R. W. Harrison, master plumber, Toronto, left on May 18 on a trip to the Old Country.

An electric fixture manufacturing business will be established by T. E. Essery in Toronto.

Damage amounting to about $4,000 was done on Lansdowne avenue, Toronto, by a break in a water main.

G. & E. Blake, St. John, N.B., have secured the plumbing contract for the new General Hospital in that city.

W. Higgins, of Higgins & Large Brampton, and Jas. Heatley, of the same town, were visitors in Toronto last week.

The School Board of Halifax has just awarded a $40,000 contract to S. Marshall Sons, contractors, for alterations to Albro Street school.

Carter Bros., Picton, have the contract for the steam heating and plumbing of the new Carnegie Library now in course of erection in that town.

A. Rodgers, of the plumbing firm of A. Rodgers & Co., Hamilton, and Geo. Stephenson, also of the Ambitious City, were in Toronto on business last week.

George Blake, G. & E. Blake, plumbers, St. John, N.B., left this month for Los Angeles, California, to attend the annual session of the Mystic Shriners.

George W. Armstrong, president and treasurer of the London Brass Works Company, is just leaving for a European trip, which will extend for two or three months.

The Star Iron Company, Montreal, for which the Maison Jean Paquette, Montreal, are selling agents, are opening up fine show and warerooms in Toronto at 138 Victoria St.

Harry Mahoney, Guelph, and Billy Mansell, Toronto, are going fishing on May 24. They have a jug full of good bait and ought to have a basket full of good stories after the holiday.

The Carriage Mountings Co., of Toronto, has commenced operations on new factory buildings at Niagara Falls, Ont. The buildings will be of the sawtooth type, and will be ready in July.

The Monarch Brass Manufacturing Company have moved their Toronto offices from 72 Dundas street to 278 Dundas street. The new premises are much more commodious and suitable for their business.

F. R. J. MacPherson, of Peterboro, has been awarded the contract for steam heating and ventilating the Separate School in his city. He will use the Pease combination steam and hot air system.

The National Plumbing Supply Company, Toronto, has secured premises at 191 and 193 Adelaide Street West, and is now ready for business with E. A. Rogers, formerly with the James Robertson Company, in charge.

The Electric-Gas Fixtures Co., manufacturers of electric and gas supplies, has been established at Galt. The promoters are: Hy. Dakin, president; E. B. Fewings, formerly with McDonald & Willson, Toronto, vice-president; R. G. Struthers, secretary-treasurer.

Through an accident in the works of the Taylor-Forbes Co., Guelph, the president, J. M. Taylor, had the misfortune to dislocate his left shoulder and as a result Mr. Taylor will be obliged to carry his arm in a sling for a couple of weeks.

Fire last week destroyed the building occupied by Magnus & Lounds, plumbers and tinsmiths, Halifax, N. S., The stock was ruined, as what was removed was in a damaged condition. The firm will be heavy losers by the fire, as there was only $2,000 insurance on the building and $1,000 on the stock.

The charges of conspiracy against the Toronto journeymen plumbers, W. Storey, W. Bush and P. McCann, arising out of the recent plumbers' investigation, have been withdrawn. This case has been put off from time to time through lack of evidence, and the Crown authorities have at last withdrawn the charges.

The Standard Fitting and Valve Co., Guelph, Ont., has been incorporated with $100,000 capital to manufacture cast and malleable iron fittings, valves, plumbers', engineers', steamfitters' and gasfitters' supplies and generally to carry on the business of foundrymen and machinists in all kinds of metals. Incorporators: Henry Aird, George W. Aird, Elbert S. Platt, of Troy, New York; John M. Taylor, Guelph, Ont.; George D. Forbes, Hespeler, Ont.

NEW INDUSTRY AT GALT.

The Canadian Brass Manufacturing Company are not yet in operation, having but recently decided to locate in Galt. The buildings which are at present in course of construction, will be completed by the Provincial Construction Company, of Toronto, within ten weeks, and it is expected that the plant will be in operation in about three months. About 50 hands will be employed at the beginning. The company will manufacture a full and complete line of brass goods and plumbers' supplies and a member of the firm has stated that orders are on file at present sufficient to keep the plant running full blast for six months.

EDMONTON HEATING CONTRACT.

A. Lee & Co., Edmonton, Alta., have recently been awarded the heating, ventilating and plumbing contract for the new Alex Taylor school in Edmonton now in course of erection. The plans and specifications prepared by Architects Johnson & Lyons call for the Pease-Waldon Co.'s patent steam heating and ventilating system. This system will be so installed as to provide for the maximum effect of gravity ventilation; or if so desired, during sluggish temperatures, perfect mechanical ventilation can be secured by adjusting the areas and employing a large 6-foot fan. The specifications also call for the most modern plumbing arrangements, lavatories, urinals, drinking fountains, etc. In fact, the new school, with its eight rooms and large assembly hall, will be the equal of any school in the Dominion, and will be a good evidence of Alberta progressiveness.

DISASTROUS FIRE AT AMHERST.

The destruction by fire of the enamelling department of the Amherst Foundry Company, Amherst, N.S., is a serious handicap to that thriving industry just at a time when the plant was in full operation and large orders in hand. Only a portion of the manufactured goods ready for shipment were saved. The building was 300 feet long and 65 feet wide, and gave employment to eighty men.

The output of this department was from $10,000 to $15,000 per month. Many of their goods were sent to upper Canadian and western cities. They have a distributing branch in Winnipeg through which their western trade was supplied. Frederick Schuler, an American expert, has charge of this department. The men were working three shifts of eight hours each. They put out from ten to twelve bathtubs and from 80 to 100 sinks per shift.

The fire did $75,000 damage, destroying the patterns for the stove and foundry department in addition to much finished stock.

THE DISPOSAL OF SEWAGE.

A valuable contribution to the literature on the disposal and purification of sewage has just been issued by the United States Geological Survey. The volume of sewage discharged by modern communities is so large and the character of all kinds of sewage is always so objectionable, that the so-called sewage disposal problem becomes, from the economic as well as the sanitary point of view, one of the most serious with which American cities have to deal. It is of vital importance to every community to secure such a disposal of obnoxious sewage as will avoid the creation of any insanitary focus or foci in the environment, or any infringement of the laws of hygiene and sanitation.

The investigations described in this publication were made at the Sanitary Research Laboratory and Sewage Experiment Station of the Massachusetts Institute of Technology, under the direction of Prof. William T. Sedgwick. The station at which the work was carried on is situated on the line of the main trunk sewer of the south metropolitan district of Boston at a point where it contains the sewage of about half a million people. At this station pumps were installed and tanks were constructed for tests of the various methods of sewage purification. The results are by no means applicable mere-

ly to large cities, but contain lessons of practical value to all communities having to deal with the ever present sewage disposal problem. The description of the experiments is preceded by a careful and elaborate historical review of the whole sewage disposal problem from its origin in the wide adoption of the water-carriage system up to the present time, when that system has become practically universal. This interesting review cannot fail to be of the highest value to expert engineers, sewage commissioners, and cities all over the United States, especially to those numerous small communities that are confronted, perhaps for the first time, with a problem that means so much for the health as well as the finances of the citizens.

PLUMBING AND HEATING MARKETS

MONTREAL.

The feature of the plumbing markets at present is a shortage in some lines of iron pipe. Although supplies were abundant a few weeks ago, and dealers were under the impression that they would be well able to fill their orders, the tremendous demand experienced lately has proved too much for their stocks, and the delay in getting skelp has resulted in the manufacturers getting somewhat behind in their orders.

Iron pipe has been steadily advancing for the past two or three months; in fact, from the first of the year, and present figures are anywhere from 10 to 15 per cent. higher than they were at that time, and the prospects are that there will likely be still more advances in the near future.

Enamelled ware is another line that will very likely be difficult to get deliveries of within the near future. The recent fire which occurred at the plant of the Amherst Foundry Co., put that firm almost completely out of business, with the result that the already overworked Port Hope people will be asked to fill, in addition to their own business, many orders intended for the former concern. As the demand kept both firms well filled up with orders, it's only reasonable to suppose that the demand for Canadian enamelware will be very much greater than the supply.

It is very difficult at present to get deliveries of plumbers' brass goods. In the first place, manufacturers are swamped under with orders with the re- that stock orders take weeks and months to get.

In fact, dealers have to look pretty far ahead in order to keep their stocks in anything like decent order. In addition to the length of time taken in transit, the congestion at the freight sheds is so great that goods lie three or four weeks before they are delivered. Where 10 to 15 days used to be the longest delays, anything from 25 to 40 days is the fashion now. In addition to the above the longshoremen's strike will, should it last for any length of time, make still further delays in all lines expected by water, and it would pay plumbers to get their orders in at once, while stocks are fairly good.

TORONTO.

Notwithstanding the fact that the big plumbers' strike has already been one week in full operation, yet the effect of the tie-up has reflected itself but slightly on the condition of the local plumbing market. Toronto business is most satisfactory at present, though, of course, the strike is bound to make its influence felt to the detriment of the trade if the struggle should turn out to be one of long duration. In Hamilton the master plumbers are maintaining the open shop and seem to have the situation well in hand.

Since the three per cent. rise in all sizes of iron and galvanized pipe ranging from one-quarter inch to four inches which took place a few days ago, there has been no further advance but the price remains very firm and supplies in all sizes are exceedingly scarce. The uncertain delivery of all sizes of pipe shows no improvement and the demand still increases.

The price of medium soil pipe and fittings remains steady at seventy per cent.

Fuller work is quoted at seventy per cent., compression work at fifty-seven and a half, and ground work at sixty per cent.

The price on lead pipe and solder remains the same, with good demand.

Last week we reported that one large firm had gone back to the January price list on enamelware; since then all the other large houses have followed suit and the market is no longer being slashed as before.

Cast iron pipe fittings are in good demand and the price remains firm at fifty-seven and a half per cent.

Business in country districts and small towns is very brisk, on account of the immense amount of renovating now being carried on all over the country. For the last few years prosperity has been general throughout Canada and the people, having recognized that cleanliness is next to godliness, now have the means as well as the inclination to pay greater attention to up-to-date bathroom fixtures and sanitary plumbing in general.

BOOK REVIEWS.

Heating by Steam and Water.

"Heating by Steam and Water" is the title of a work just issued by Chas. J. Thompson. It treats fully of the methods of installing heating apparatus in the home, and gives short and accurate rules for computing radiation, heat losses, etc., as also accurate data, consisting of charts, illustrations and description of how best to heat water for baths, swimming pools, etc., etc. It contains 268 original drawings, illustrating the text.

Nothing is shown that has not been tried in practice, and in the latter part of the book numerous examples of steam and water heating are shown, which by some might be called freaks, particularly on account of the sizes of pipes used.

It is a work that will be found extremely interesting and useful to all in the heating trade, and constitutes a most useful reference book on the subjects treated.

The work is conveniently divided into 52 chapters, and each subject is fully discussed and clearly treated thereunder.

There is hardly any point that arises in either steam or hot water heating for residences, stores or moderate-sized apartment houses that is not clearly illustrated. A few of the subjects are: "Domestic Vacuum Heating," "Estimating Materials and Costs," "Heating Country Stores," "Pipe Sizes," "Heating Swimming Pools," "Boiler Capacities and Fuel Consumption," "Practical Information."

It is written by a practical man, is interesting in its style, and quite free of all perplexing formulae.

The work is published by the Plumbers' Trade Journal, New York, the price being $3. For sale in Canada by the MacLean Publishing Co., Toronto.

Rumford Fireplaces.

G. Curtis Gillespie, M.E., has brought a treatise on fireplaces, entitled "Rumford Fireplaces and How They are Made," which is a most interesting work on the subject. He says in the introduction: "As I have remarked, large sums of money have been spent on mantels, on the frame of the picture, while the picture itself has cost nothing, and is more often than otherwise an asset, as it costs less to leave the opening in the chimney than to fill it with brick. I would suggest that where economy is of vital importance that less be spent on the mantel and more on the fireplace."

The work contains a full copy of Benjamin, Count of Rumford's, "Essay on Fireplaces and Chimneys," and will surely prove valuable to all interested in the construction of good chimneys and the rectifying of any trouble that may be found in connection with them.

"There are various causes," says Count Rumford, "by which chimneys may be prevented from carrying smoke; but there are none that may not be easily discovered and completely removed."

The book is profusely illustrated and contains many beautiful designs of fireplaces and mantels, beside over a hundred designs of artistic andirons.

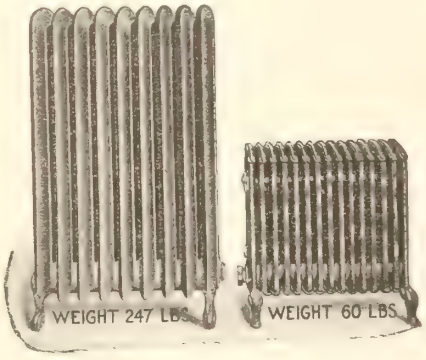
The book is published by Wm. Comstock, New York, and can be secured in Canada from the MacLean Publishing Co., Toronto.

SCOTTISH MADE LINES.

Jones & Campbell, of Torwood Foundry, Larbert, Scotland, have forwarded a copy of section 7 of their catalogue, illustrating their popular designs of lavatory stands, frames, brackets, etc., as used by plumbers. They claim that their wholesale tariff will be found, upon inspection, to compare very favorably with others of a similar kind.

Mr. Steamfitter!

Here are Two Pictures. Just Look at the Difference.



If you want to please your customer give him

Kinnear Pressed Steel Radiators

He will like their appearance. Save half the space that cast ones will take up, heat his house in less than half the time. You will save money in freight and men's time handling, and get a reputation of being right up to date. Kinnear Radiators occupy half the space of cast ones, hold 38 per cent. less water, heat in one third the time and heat same amount of space for same number of feet of radiation.

For Further Particulars Write

A. WELCH & SON, 302 Queen West, Toronto

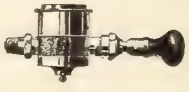
Agents for Ontario

Exhaust Heads

They prevent the continuous drip from exhaust steam pipes on roofs of buildings.

GAUGE COCKS,
WATER GAUGE MOUNTINGS.

PYROMETERS FOR BAKERS' OVENS,
CYLINDER OIL PUMPS.



WISDOM COMES WITH EXPERIENCE.

TRADE MARK J.M.T. REGISTERED

Our twenty-five years' experience in the manufacture of

Engineers' Brass and Iron Goods

enables us to know what is best for the requirements of the trade; how to make these goods for

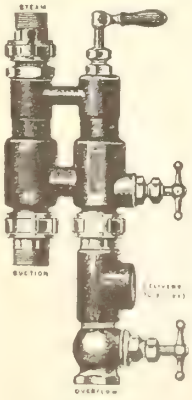
EFFICIENCY and DURABILITY

You can rely upon **J.M.T.** goods proving equal to all the requirements under which they are to be used.

"FULLY GUARANTEED"

Steam and Oil Separators

For vertical and horizontal pipe lines.



The Genuine Hancock Inspirator

A double tube boiler feeder embodying features not contained in other machines.

Safety Valves

We make all kinds for stationary, locomotive and marine boilers.

Steam Whistles

Plain, chime and combination.

The Jas. Morrison Brass Mfg. Co. Limited.
Toronto, Ont.

NIAGARA CHAIN

FOR

PIPE HANGING

Most convenient and neatest as well as the most economical hanger on the market.

Pipe may be hung any distance from ceiling with this hanger.

Permits of easy and exact adjustment.

Write for Samples and Prices

Oneida Community, Ltd.

Div. G. **ONEIDA, N.Y.**

"The Goods That Please"

Est. 1869 Inc. 1898

HAYS

BRASS and IRON FITTINGS

FOR

PLUMBING, WATER, GAS and STEAM

Will Not Disappoint

Hays Mfg. Co.

12th and Liberty Sts., ERIE, PA.

SCIENTIFIC
DRAIN AND SOIL PIPE &c.
RECOMMENDED AND SPECIFIED BY SANITARY AUTHORITIES.
SANITATION
WALTER MACFARLANE & CO.
SANITARY ENGINEERS • SARACEN FOUNDRY, GLASGOW.
CASTINGS SUPPLIED CUT & FITTED TO MEASUREMENTS
DRAIN PLANS WORKED OUT FOR ARCHITECTS
CATALOGUES AND PRICES ON APPLICATION

AGENTS:

W. PORTEOUS JACK, 1256 Robson, Vancouver.
GEO. PEATT & CO., P. O. Box 466, Winnipeg, Man.
BAXTER, PATERSON & CO., 102 St. Antoine St., Montreal.

KERR'S GLOBE AND GATE VALVES
STRICTLY HIGH GRADE. TESTED & PACKED
THE KERR ENGINE CO. LIMITED
VALVE AND HYDRANT MANUFACTURERS
WALKERVILLE, ONT.

Jardine Hand Drills

New Designs

Get samples of these machines for your show room. They will interest your customers and prove a good investment.

It pays to sell the best Tools.

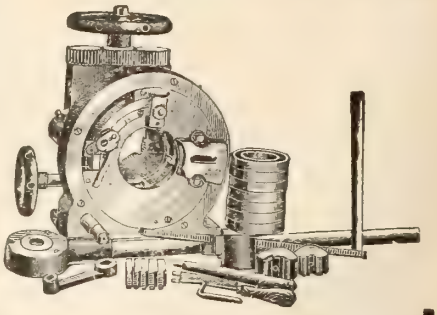
A. B. JARDINE & CO.
HESPELER - - - ONTARIO

This is the Mark that Means Something

It is the distinctive brand of genuine Armstrong Stocks and Die and Pipe Fitters' Tools.
No "Armstrong pattern" or "just as good as Armstrong" have this stamp. Don't buy anything in this line that hasn't this brand as it is the mark of genuincness.

THE ARMSTRONG MANUFACTURING CO.,
292 Knowton Street, Bridgeport, Conn.

A Certain Sense of Satisfaction



goes with every MERRELL PORTABLE HAND MACHINE, PIPE THREADING and CUTTING MACHINE. We build them that way.

For doing ALL kinds of threading—under ALL conditions—labor trouble and faulty material included—where speed, durability and ease of control count for something, our word to you is to investigate the MERRELL.

Whether it be stationary or portable—hand or power driven—30 DAYS FREE TRIAL must prove conclusively that your choice should be the MERRELL.

This Portable Hand Machine has encased gears, MERRELL standard quick opening and closing die-head, and the latest improved Cutting-off Knife.

Let us tell you more about this machine—The Chasers, Vise and the large range of work covered.

Catalogue for the asking.
Quick shipments.

THE CANADIAN FAIRBANKS CO.
Sole Agents for Canada Limited
MONTREAL, TORONTO, WINNIPEG, VANCOUVER

CLINCH YOUR TRADE and assure your profits by letting me know your ENAMEL WARE wants. Quality and dispatch are the key notes of my business.

ORLANDO VICKERY

178-180 Victoria Street TORONTO, CANADA

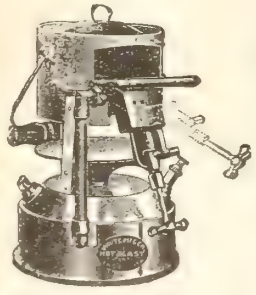
By Stocking

"Diamond" brand Fittings

you capture the paying trade. And you keep it.

WHOLESALE ONLY

OSHAWA STEAM & GAS FITTINGS CO., LIMITED
OSHAWA, CANADA



HOTTEST ON EARTH

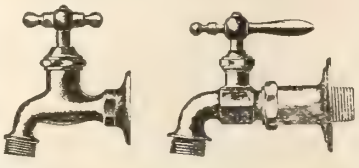
Our Bonanza Furnaces are known to produce more heat with less fuel than any other make. Jobbers sell at factory prices. Satisfaction guaranteed or money refunded.

No. 38—Price, each, *$7.80* net
No. 39—One size smaller, *$5.85* net

THE TURNER BRASS WORKS
53 MICHIGAN STREET, - CHICAGO, U.S.A.

TWO FREE
for every one sent you defective. Isn't that guarantee enough?

Glauber Brass Mfg. Co.
Expert Makers of Fine Brass Goods
CLEVELAND - - OHIO



BRONZE POWDER and BRONZE LIQUIDS

ARE *GUARANTEED* WHEN MADE BY

The Canadian Bronze Powder Works

Backed by long experience, R. E. Thorne & Co. have unsurpassed facilities for filling orders at short notice. Write for particulars.

MONTREAL — TORONTO

NO ORDER TOO LARGE. EXTENSIVE WORKS AT VALLEYFIELD, QUE.

Forwell Foundry Co.

BERLIN, ONT.

Manufacturers of

SOIL PIPE, FITTINGS, and CAST IRON SINKS

Ask Jobbers for "F. F. CO." Brand

Let Our Beaver Do Your Work.

You Don't Have to Change Dies.

Cuts 1, 1¼, 1½ and 2″ perfect threads, all with one set of chasers

RAPID WORKER

The Hand Stock that Starts Easy and Finishes Easier.

"The New Way."

You Will Find it a Sure-enough Beaver.

Write for our special 10-day trial offer

You cannot afford to take the time to thread pipe by hand in any other way.

Other sizes of Beavers will be born soon—¼ to ¾—2½ to 4—4½ to 8—8 to 12.

Manufactured by

Borden=Canadian Company

166 Adelaide Street West, Toronto

WE do not claim to make the only good boiler on the market; but — and this is important—most practical men declare that the **Sovereign Boiler** is representative of all that is best about modern heating systems.

THE

"SOVEREIGN" BOILER

is Sovereign in Quality as well as in name — it is, **the only water post Boiler built with the first section over the Boiler 50% larger than any of the others.** The **Sovereign** has a separate clean-out door for each flue section and is marketed on its merits—not because it is cheap.

TAYLOR - FORBES COMPANY, Limited

Head Office and Works: GUELPH, ONT.

TORONTO—1088 King St. West. **MONTREAL—122 Craig St. West.**

ROBERTSON'S MARBLE LAVATORIES

In addition to the goods illustrated, we manufacture and carry in stock a full line of staples, such as Brass Compression, Fuller and Ground Work, Soil Pipe and Fittings, Iron Pipe and Fittings, Engineers', Gasfitters', Steamfitters' and Mill Supplies. A Catalogue for each of these departments will be cheerfully forwarded on application.

The James Robertson Company, Limited

265 King Street West, TORONTO

PLUMBER & STEAMFITTER OF CANADA

SUBSCRIPTION : ONE DOLLAR PER YEAR. PUBLICATION OFFICE : 10 FRONT STREET EAST, TORONTO

Vol. I. No. 5. (New Series). MONTREAL, TORONTO, WINNIPEG, JUNE 5, 1907. Old Series, Vol. XIX. No. 15

A POLICY GUARANTEEING SUCCESS

Mr. Plumber ! When you place your orders with a Reliable, Progressive, Twentieth Century House you practically take out a policy assuring success.

WE ARE HEADQUARTERS FOR

PLUMBERS' BRASS WORK
ENAMELWARE and CLOSETS
BATHROOM WOODWORK
IRON PIPE and FITTINGS
LEAD PIPE, LEAD TRAPS
Etc., Etc.

PROMPT DELIVERIES
A SPECIALTY

SOMERVILLE LIMITED

59 Richmond Street East, TORONTO.

ROBERTSON'S MARBLE LAVATORIES

In addition to the goods illustrated, we manufacture and carry in stock a full line of staples, such as Brass Compression, Fuller and Ground Work, Soil Pipe and Fittings, Iron Pipe and Fittings, Engineers', Gasfitters', Steamfitters' and Mill Supplies. A Catalogue for each of these departments will be cheerfully forwarded on application.

The James Robertson Company, Limited

265 King Street West, TORONTO

Low Tank Combinations

ALL STYLES

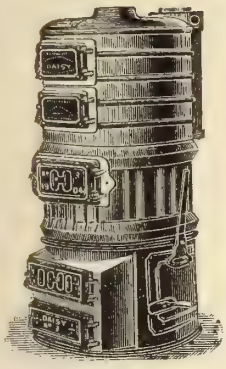
BEST ON THE MARKET

PROMPT DELIVERY

SOMERVILLE LIMITED

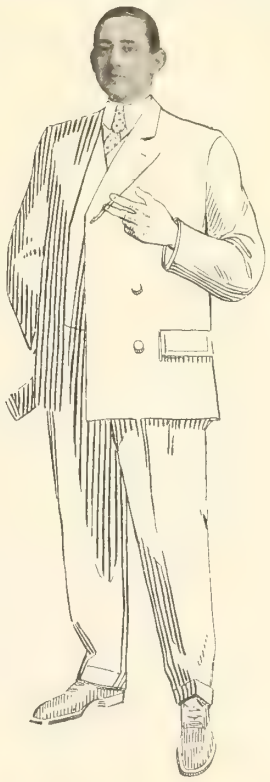
59 RICHMOND STREET EAST - TORONTO

The DAISY Hot Water Boiler



carries a guarantee which is to our business what a reputation is to an individual. It is the index by which the world gauges our standing in the commercial world.

The reputation of the Daisy stands highest among the makers of Hot Water Boilers and it acquires the enviable position only after years of the severest tests.



CLUFF BROTHERS

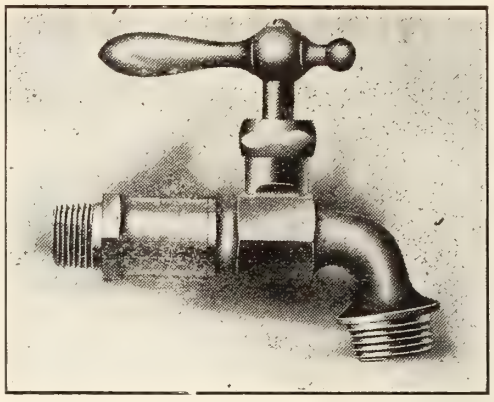
Lombard Street, TORONTO

Selling Agents for WARDEN KING & SON, Limited

Monarch is "King."

WE ARE THE PEOPLE

who please our Customers first, last and always.



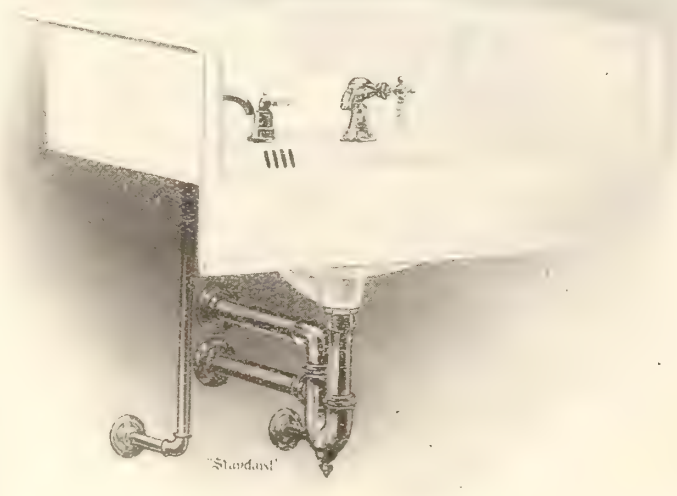
PLUMBERS REFER PERFECT **Goods** and use the **Monarch** "fully tested" **Compression Work, Fuller Work, Quick Opening Hot Water Valves,** etc., etc.

Mail Orders Solicited. Prompt Attention Given.

Monarch Brass Manufacturing Co., Limited

Factory: Port Colborne, - Ont.

Office and Warehouse: 278 Dundas St., - Toronto



"Standard" Plate P. 545 Porcelain Enameled "Recess" Design Lavatory, with Slab, Bowl, Overflow, Back and Ends all in one piece, Nickel-plated "Torrance" pattern Fuller Faucets with China Handles and Indexes, Supply Pipes, Keystone Waste with China Handle and "P" Trap with Waste and Vent to Wall.
Designed for use in Alcoves, Closets and Wardrobes in offices, hotels and other public buildings.

"Standard"

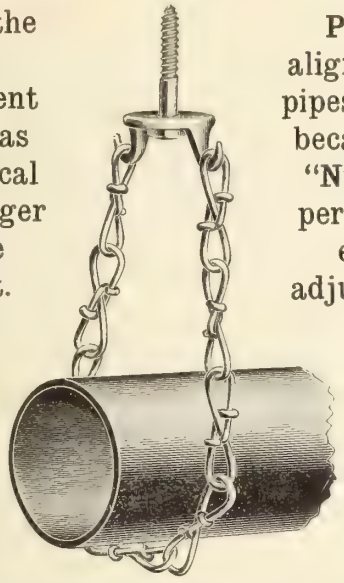
Fixtures in a Place By Themselves.

Our extensive magazine advertising has taught the public to regard **"Standard"** Porcelain Enameling over Iron as a new and superior method in the manufacture of plumbing equipment. Therefore in suggesting **"Standard"** Fixtures for residence or public building you are merely offering the owner what he already considers *the best.*

Standard Sanitary Mfg. Co.
PITTSBURGH, PA.
U. S. A.

NIAGARA CHAIN
FOR
PIPE HANGING

Makes the most convenient as well as economical Pipe Hanger on the market.



Perfect alignment of pipes assured because the "Niagara" permits of exact adjustment.

Write for samples and prices.

Oneida Community, Ltd.

Niagara Falls, Ont.

"The Goods That Please"

Est. 1869 Inc. 1898

HAYS

BRASS and IRON FITTINGS

FOR

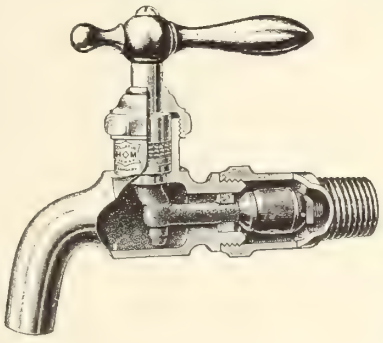
PLUMBING, WATER, GAS and STEAM

Will Not Disappoint

Hays Mfg. Co.

12th and Liberty Sts., ERIE, PA.

GET AWAY FROM THE HAMMER



In Mueller Fuller work there is a preliminary valve which partly closes the waterway and gradually reduces the pressure before the ball is seated.

THIS FEATURE PREVENTS HAMMERING

It has been used in Mueller goods for half a century. No one has found anything more effective. Fuller Bibbs are made In Finished and Finished Nickel-plated, and are

Unconditionally Guaranteed.

Absolute protection to users. Write for prices and literature.

H. MUELLER MFG. CO.

Works and General Office, **DECATUR, ILL.**
West Cerro Gordo Street

Eastern Division, **NEW YORK CITY**
254 Canal St., cor. Laf.

Modern Conveniences for Farm Homes

The First of a Series of Articles Intended to Help Canadian Plumbers in Educating Residents in Country Districts to the Necessity of Better Sanitary Arrangements.

By Elmina T. Wilson, C.E.

The failure to employ modern methods of lightening labor inside the house is a great hardship on many farms. Thoughtfully planned, conveniently arranged, and carefully constructed buildings are as essential in the country as in the city. Plumbing is becoming a necessity, not only for comfort and convenience but even more for health and cleanliness; and the proper disposal of the wastes of the household should not be neglected.

For domestic purposes the water must be clear, pure, and palatable; the essentials being freedom from disease germs, turbidity, color, odor and taste. Of the various sources of supply springs usually rank first and deep wells next in desirability. The character of the water in a shallow well depends upon its past history and present environment. If it has traveled long distances through the soil without encountering organic impurities or taking up objectionable mineral salts, or if after possible pollution it has been filtered and purified in its travels, its quality is probably excellent. But shallow wells near barnyards or privy vaults should always be regarded with suspicion. It is well to remember that the price of pure water, wherever you go, is everlasting and unremitting vigilance.

The Water Supply.

The danger of using the ordinary shallow well is known to everyone. To locate a cesspool and a well on the same small piece of ground is almost impossible without contaminating the water. Slop water of any kind should never be thrown near the well. The top four or five feet of the well casing should be laid up in cement mortar to prevent water flowing in without first filtering through the ground. A sewer pipe or waste drain near a well is dangerous because such a pipe or drain is seldom water-tight. If a sewer pipe must be run near a well, cast-iron pipe should be used.

The carelessness that will locate the barn on higher ground than the well and take no precautions to divert the surface drainage is almost as deplorable as the use of the cesspool or privy vault. To keep the earth clean in the vicinity of the water supply is of the greatest importance and requires constant watchfulness.

There are localities where the only available water supply is obtained by storing the water which falls from the roof of the house during rainy weather. In other places the water is so hard that rain water is desirable in the laundry and bathroom.

The size of the cistern needed will vary with the size of the family, the length of the dry season, and the number of plumbing fixtures supplied with the rain water. This cistern may be located close to the house for convenience and should be built of good, hard brick, with walls not less than eight inches in thickness, laid in Portland cement mortar. The bottom should be laid with two courses of brick well bedded in the cement mortar. If the water is to be used for drinking or for cooking, a filter chamber should be added by building an 8-inch partition wall after the bottom has been paved. This wall should be built a little higher than the outlet of the overflow pipe. The walls of both compartments should be plastered with a good coat of cement mortar, composed of one part good Portland cement and two parts clean, sharp sand, excepting 10 or 12 inches of the bottom of the partition wall (4 or 5 courses of brick, which are laid together without cement) for the water to pass through. The water from the roof is collected in one compartment and is pumped from the other, the filtering material being put in the first compartment. An overflow pipe should be provided on the side of the cistern which the water enters, the opening of the overflow pipe being fitted with a fine strainer to exclude insects and vermin. A cut-off should be placed on the rain-water pipe leading to the cistern to divert the flow to the outside when necessary, as, for instance, for a short time at the beginning of the rains to exclude the dirt collected on the roof and in the gutters.

The cistern may be built of concrete, and may be either round or rectangular. The round form is the more difficult to build, but it is the stronger. A description of the method of building a rectangular concrete tank will be given under "Disposal of sewage" in another article.

A small force pump, placed at one end of the kitchen sink, with the suction pipe reaching to the cistern, is a convenient means of getting the soft-water supply if the more expensive method of using a gravity tank or a pneumatic tank and piping the soft water to the sink, wash basins, and bath tub is not desired. If a gravity soft-water tank is placed in the attic it can have a direct connection with a rain-water leader, which will keep the tank full during the rainy season. This connection must be supplied with an automatic cut-off which will send the water to the cistern when the attic tank is full. The force pump can be connected to the tank and used to fill it in dry seasons.

Elevated Tanks.

To have a constant water supply in the kitchen and bathroom it is necessary to have some means of storing it under pressure. An elevated tank which will deliver the water by gravity may be used, or a pneumatic tank which will deliver it by air pressure. The labor saved by having the water carried to the house, barn, and garden will soon pay for the storage tank, while the value of adequare fire protection and the healthfulness of sanitary plumbing cannot be estimated in dollars.

If the gravity system is chosen, the tank for the storage of the water may be in the attic or on an outside tower. If a windmill is used for power, a small tank can be supported 20 to 40 feet from the ground, on the same tower. These tanks can be constructed of wood or of galvanized steel, and of capacity varying from 300 to 2,000 gallons. If a larger tank is desired, a tank on an independent tower should generally be used with pipe connections to house and barns. When the storage for the house supply is in the attic, too large a tank should not be used, as water is heavy (62.5 pounds per cubic foot) and there is danger of overloading the attic floor unless it has been especially designed to carry the tank.

Use Overflow Pipes.

Attic tanks are constructed of wood lined with zinc or lead, of galvanized steel, of cast iron, and of wrought iron. Such tanks should always be provided with an overflow pipe to carry off the water if the float valve fails to shut it off when the tank is full. If of iron or steel, a galvanized steel tank pan with a drain connecting with the overflow pipe should be placed beneath the tank to prevent damage to floors and ceilings from condensation of moisture on the outside. The water supply is regulated by means of a float valve, which cuts off the inlet pipe when the tank is full enough. The size of the tank will be regulated by the power used to raise the water as well as the amount required by the family. The hydraulic ram or the windmill will require only a small storage tank, as they are so easily set going. If an engine is used, a tank that will hold a two or three days' supply would be more convenient and economical. A closed steel tank, fitted with a water-seal air valve, may be used in the attic with the overflow pipe leading to the stock tank in the barnyard. This insures a constant renewal of the water. There is one farm in Illinois where the water supply is forced to an attic tank and the fall of the surplus operates a water motor for lifting the cistern water to another tank in the attic, and then the surplus water goes to a tank in the haymow of the barn with an overflow pipe to a stock tank in the barnyard. This illustrates how well the head can be made to save the heels.

If all the plumbing fixtures are on the ground floor, the closed steel tank for the cold-water supply can be placed in the kitchen or bathroom. If desired, the entire water supply can be made to pass through this house tank and so the house supply will be always fresh. With a closed tank there is no danger from overflow.

A tank like this, 12 inches in diameter and 4 feet high, will hold 24 gallons and cost about $16. An open galvanized steel tank can be made or can be bought ready-made. A ready-made one with a capacity of 100 gallons will cost about $8, while a 500-gallon tank will cost about $16.

Sufficient pressure to force a water supply wherever desired in a farmhouse

may be secured at all seasons by means of a pneumatic tank built of steel plates and located in the cellar, or in a small building erected over the well, or even buried in the earth if desired. It is superior to an elevated tank because the pipes and tank can more easily be made frost prrof in winter and the water will be cooler in summer. It is closed to dust and light and has the additional advantage of resting upon the solid ground.

Water is pumped into the bottom of this air-tight tank, and as the water rises in the tank the air above it is compressed. The expansion of this compressed air will force the water through the supply pipes at the bottom of the tank to points where the water is required. The pressure is increased by pumping more water into the tank and decreased by drawing water off. A 15-pound pressure will raise water to a height of 33 feet, a 10-pound pressure to a height of 22 feet, etc. The correct amount of air can be supplied and maintained by an automatic air valve, by a pump that forces both air and water into the tank at the same time, or by a hand air valve. The last method is not self-regulating, but if water is supplied to the tank by a hand force pump, it will not require mush more attention to regulate the air pressure also.

Pneumatic Tanks.

The water can be forced into the pneumatic tank by the same means required to elevate it to a gravity tank, i. e., by a windmill, gas engine, hot-air engine, hydraulic ram, or by hand. From ten to twenty minutes a day with a good force pump will furnish a moderate supply. If more than 100 gallons a day are required, it is better to use some other means of pumping. If an engine is used, a large tank is more economical, and twenty minutes' pumping twice a week should furnish the supply. With a windmill an automatic regulator should be used, which will throw the windmill out of gear when the pressure reaches a given amount and start it again when the pressure is relieved.

The prices vary with the different manufactures. A tank 30 inches in diameter and 10 feet long, which would supply the needs of a family of five, is listed at from $101 to $138 (subject to discount). The expense for repairs to an outfit like this is very slight and the time required for pumping varies with the power used.

Neighbors can frequently combine and put in one large plant for supplying water to several houses. This decreases the cost to the individual and gives a greater pressure in case of fire. The greater the horizontal distance the water is carried the larger the pipes should be to lessen the loss of pressure by friction.

What will be the most convenient and economical means of forcing water into the storage tank depends upon the situation in each case. The source of the supply, the amount required, the need of power for other purposes, the available fuel, and the cost of labor will all have a bearing on the matter. The hydraulic ram and the windmill have the advantage of operation without fuel, but the ram requires at least 18 inches of waterfall, while with the windmill the daily supply of water is not always subject to control. The gas or hot-air engine requires fuel and attendance, but the supply is more easily regulated

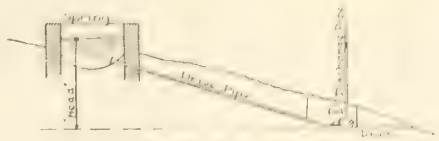


FIG. 1.—Setting of hydraulic ram

The hydraulic ram (Fig. 1) can be used to fill the storage tanks if the source of supply is a spring, flowing well, or running stream from which enough fall to supply the power can be obtained. Its use is practicable with a fall of only 18 inches, but with greater heads water can be forced to higher elevations and to longer distances. The head can be increased by damming the stream or by sinking the ram into a pit, if a drain can be secured to keep the pit free from water. The relation between the height of the spring, or source of supply, above the ram and the elevation to which the water is to be delivered determines the proportion of water raised to water wasted. It is not economy to increase the fall more than is necessary to supply the required amount of water, as the durability of the ram will be lessened. The amount of water procured by means of a ram from a very small fall makes a good supply because the ram is always going.

It is not necessary that the water which is pumped should be the same as the power water. Pure water can be delivered by the use of impure water without danger of mixing by means of a compound ram.

The size of the ram to be used will depend upon the amount of water power and both the amount of water required and height to which it is raised. The water can be delivered into an elevated tank or a pneumatic tank as desired and the overflow can be utilized by a water motor for pumping cistern water, shelling corn, or in any of the other numerous ways of saving hand labor.

The length of the drive pipe depends upon the fall to the ram and the height to which water is delivered. The delivery pipe will be governed by the conditions usual to water pipes. After the pipes are laid it is well to leave them uncovered until they are given a test in order to discover any leaks. The attention required by a ram is very little.

A visit of inspection twice a week may be necessary. The mechanism is simple and, as the wearing is only in the two valves, the expense of maintenance is small. A small ram can be installed for $50 or less (pipe not included), and will be found a useful means of furnishing a water supply in many cases.

Securing Water by Windmills.

A good and simple way of securing a supply of water is by the use of a windmill. When the machine is properly constructed it will pump large quantities of water, and, like the ram, without cost, as the wind is free and the cost of repairs is very small. The tower should lift the wheel 10 or 15 feet higher than the tallest obstruction. The galvanized steel tower has almost entirely taken the place of the wooden tower, and is proving very durable. A combination tower which carries both a windmill and a storage tank is furnished by some manufacturing companies under the name of "[illegible]" outfits. This outfit gives ample pressure for ordinary requirements and can be made frost proof by [illegible]. The capacity pipes in two or more wooden casings with air spaces between, the outer casing being of matched boards and painted. A combination pumping and power mill is also manufactured, at a small additional cost, which will pump the water, grind the feed, shell the corn, saw the wood, and do the washing and churning with no expense for fuel; but the wind must blow.

If the windmill supplies a tank in the attic the supply is regulated by a tank float which shuts off the supply pipe when the water reaches a certain height and admits water again when the water level of the tank is lowered. An expansion joint should be used on the supply pipe to prevent the overstraining of the joints due to change of temperature. The same pipe that delivers water to the tank may be used to supply the house fixtures. If the windmill supplies a pneumatic tank an automatic pump should be used which will throw the wheel out of gear when a certain pressure is reached, and, when water is drawn, the reduction of the pressure will throw it in gear again.

The cost of installing a windmill will depend upon the depth and character of the well and its distance from the house and barns, upon the height of the tower, upon the elevation or pressure of the storage tank, and upon the amount of water required each day. These items vary so much with the individual cases that it is unsatisfactory to attempt to give even general figures. Any manufacturer of windmills will furnish an estimate upon application.

Gas or Hot Air Engines.

Small gas or hot-air engines are now manufactured for the express purpose of pumping water from cisterns, springs, or wells to elevated or pneumatic tanks to furnish supplies for houses and barns. One advantage of the engine over the hydraulic ram or the windmill is that the water can be pumped when it is wanted, and the size of the storage tank can be more accurately determined. An engine can be selected which will burn any kind of fuel—natural gas, gasoline, kerosene, coal or wood. Such engines do not require an expert to run them, and, like the power windmill, can be used for driving other light machinery when not needed for pumping water.

The arrangement of the pipes to carry the water is governed by the same conditions as when other power is used. No more elbows or sharp bends should be used than are absolutely necessary, as they cut down the capacity of the engine; and when the water is to be pumped through a great length of horizontal pipe it is well to increase the size of the pipe.

The cost of a two or three-horsepower engine will be from $60 to $130. The cost of the fuel is very small, as a half hour's pumping a day will furnish the average supply of water.

(To be continued.)

Should you wish to be considered a good buyer, select styles or grades of goods for stock by looking through the eyes and pockets of your customers.

PLUMBER AND STEAMFITTER
OF CANADA

The MacLean Publishing Co.
Limited

JOHN BAYNE MacLEAN - - - President
W. L. EDMONDS - - - - Vice-President
H. T. HUNTER - - - Business Manager
WESTON WRIGLEY - - - Managing Editor

Publishers of Trade Newspapers which circulate in the Provinces of British Columbia Alberta, Saskatchewan, Manitoba, Ontario, Quebec Nova Scotia New Brunswick, P. E. Island and Newfoundland

OFFICES:

MONTREAL - - - - - 232 McGill Street
Telephone Main 1525
TORONTO - - - - - 10 Front Street East
Telephones Main 2701 and 2702
WINNIPEG - - - 511 Union Bank Building
Telephone 3726
LONDON, ENG. - - - - 88 Fleet Street, E.C.
J. Meredith McKim
Telephone, Central 12960

BRANCHES:

CHICAGO, ILL. - - - - 1001 Teutonic Bldg.
J. Roland Kay
PARIS, FRANCE - Agence Havas, 8 Place de la Bourse
MANCHESTER, ENG. - - - 92 Market Street
ZURICH, SWITRERLAND - - - Louis Wolf
Orell Fussli & Co.

Subscription, Canada and United States, $1 00
Published Twice Every Month
Cable Address { Adscript, London / Adscript, Canada

WINNING FAVOR.

The publishers are being greatly encouraged by the hearty support tendered The Plumber and Steamfitter by the trade in all parts of the Dominion. Both supply men and masters recognize in the paper a means of communication which can be very helpful to all interested in the trade in Canada.

Two very nice commendations received during the past week from publishers of United States papers also indicate that the worth of the paper is appreciated across the border, the publishers there realizing that the new postal laws provide an obstacle to increasing their circulation in Canada.

John K. Allen, the publisher of Domestic Engineering, Chicago, a journal with a continental reputaion for the quality of its technical articles on plumbing and heating subjects, and who published a Canadian edition of his paper a couple of years ago, expresses a frank opinion of The Plumber and Steamfitter as follows:

> "We wish you every success in Canada. This is a field that, under the circumstances, no United States paper can fill satisfactorily."

Copper and Brass, a bright new paper published at Detroit, Mich., has the following kind reference to Hardware and Metal and this paper:

> "The Plumber and Steamfitter of Canada is the name of a new weekly publication started by the MacLean Publishing Co., of Toronto, Montreal, Winnipeg, et cetera. The new journal appears in neat dress, full of interesting matter well edited. If pushed with the characteristic MacLean enterprise it will soon reach the position of Hardware and Metal, published by the same company, which recently issued a 244-page spring number that shows up well alongside of any paper published in the interests of any trade."

WHY ARE PLUMBERS UNPOPULAR?

Coming down University avenue, Toronto, last Monday morning an amusing incident was noticed by The Plumber and Steamfitter editor—amusing from one standpoint yet serious from another.

Two men on bikes were hustling down the avenue when an Irish setter by some mischance got mixed up with the rider in the lead; the dog, man and wheel landing in a heap with the second rider finding it impossible to stop in time to avoid the crash, and he also added to the confusion by tumbling over, his wheel and a kit of plumbers' tools mixing the wreckage up in such a manner that it was only with the help of spectators that the two men, the dog, bicycles and tools were satisfactorily disentangled.

The incident, of course, soon attracted a crowd and assistance was immediately tendered the unfortunates. Some bystander, however, who evidently held a grudge against some plumber, noticed the tools, and sizing both riders up as plumbers, said: "They're plumbers. Let them alone, they deserve more than they got." The sentiment expressed seemed to meet with general favor, as the crowd drew back and let the plumbers finish the work of pulling themselves and their tools together.

The incident was amusing—it would be funny at any time to see plumbers on wheels hustling down to do a job, so contrary is this to the accepted order of things—but a moral can be drawn upon which some thought can be directed to advantage.

Why was the fountain of human sympathy so easily dried up in this instance? Why did others so readily accept the churlish remark of the bystander with the grudge? Is the plumbing trade, as a whole, so unpopular that to be a plumber is to be set apart from other men? If so, it is high time for something to be done to win back public favor.

Plumbers are undoubtedly doing an important work for mankind in improving the sanitary arrangements. Doctors who cure, or try to cure, disease are honored citizens, while plumbers, who prevent disease and are forced to do some of the dirtiest work for mankind, are apparently considered by some as common nuisances.

It has been, of course, a common practice for plumbers to argue against patching up old fixtures and advise in favor of costly new fixtures. This has tended to make plumbers' bills look large, and the men who have to do the paying have paid the bill grudgingly, even though it may have prevented a disease which might have claimed a whole family as victims.

Whatever the reason, the facts are that plumbers are looked upon as robbers by a large element in the community. What steps are to be taken to overcome this feeling are not yet clear. Can some reader of The Plumber and Steamfitter suggest something?

CANADIAN ENAMELWARE.

Canadian manufacturers of enamelware are, as is evidenced by the increasing size of their plants, steadily winning favor for their product. This is largely due to the improved quality of the goods that are being turned out.

The Standard Ideal Co., Port Hope, have doubled the size of their plant twice in the past couple of years, but they have all they can do to keep pace with the increasing demand for their goods. They are now turning out some of the finest range outfits for schools and public buildings and claim to be able to duplicate any grade of enamelware produced in the world. At present they are at work on a magnificent new loose-leaf catalogue which is expected to be ready for distribution in September. In it will be included all their latest patterns now being prepared for the trade in Canada.

The Amherst Foundry Co., Amherst, N.S., have made marvellous progress during the past two years and the recent destruction of their works by fire will probably, in the long run, prove a blessing to the company. For the present it will hamper their trade, but the disaster will enable them to rebuild on a larger scale and prepare entirely new patterns and designs. Mr. Vickery, their Toronto representative, states that, owing to the fire, it will be necessary to stop advertising, goods not being available to supply the demand. This shortage will also affect Mr. Vickery's

largest customers, the departmental stores, the Standard Ideal Co. having declined to supply goods other than through the regular trade.

While American enamelware is not being imported in as large quantities as in former years, the Standard Sanitary Manufacturing Company, of Pittsburg, still find a large sale for their high class product, their line being a popular one with many plumbers and architects who have for years known by practical experience the merits of this line. Other American manufacturers sell in Canada, of course, but the favorites with the Canadian trade are undoubtedly those which have been referred to.

Exhibition of a Modern Kitchen and Bath Room at a Pure Food Show at Lewiston, Me.

PAY ATTENTION TO DISPLAY.

Plumbers' establishments, as the majority of them appear at present, can hardly be called business places or stores. More properly speaking they are shops. The word "shop" does not convey to us the idea of size or attractiveness. A large number of plumbers' establishments have fallen into a disreputable condition. No thought is now taken by them for cleanliness, attractive displays, or convenient arrangements. The plumbing business would be put on a stronger and more lucrative basis if more attention were paid to the details and the things of apparently lesser importance.

Plumbers could very easily make their stores (for we should be able to call them by that name) more attractive by arranging a display of their goods; either in rows and on shelves, in the front part of their shops, or by partitioning off a little apartment to represent a bathroom and array as many plumbing goods as possible in this little room. The accompaning illustrations, kindly loaned us by the Domestic Engineering of Chicago, show a very neat and attractive arrangement of goods for a modern kitchen and bathroom. It would involve very little work, and the efforts made would be well repaid by an increase in business and visitors to the store. Plumbers cannot ignore the presence of strong competition, and the fact that the only way to attract customers is to have an attractive display of goods.

THE INVENTOR'S PLAYTIME.

At the recent celebration of his sixtieth birthday anniversary, Thomas A. Edison observed that he had spent the early part of his life in perfecting inventions for the benefit of the public, and that he would spend the rest of his life at play.

No one who knows Mr. Edison, or has some knowledge of his busy life, will fancy for a moment that he proposes to spend his remaining days idly twirling his thumbs or disporting himself in the games of grown-up childhood. He will play at inventing instead of working at it as a source of revenue. Freed from all commercial consideration, with mental faculties more than ever alert, the world will expect him, even more than he claims to have done in the past, to invent for the benefit of the public.

Scarcely would it be possible for Mr. Edison—or for any inventor—to stop inventing. The inventive faculty knows no ordinary metes and bounds. It works and struggles and perseveres when it must earn bread and butter; but it does not become inactive when the bread and butter are assured in abundance.

The inventor's playtime should be the time of his greatest achievement. The inventor, free from the cares and worries of business, should do the best work of his life.

KEEPING TRACK OF PRICES.

It is very important that the buyer keep track of every quotation that is made to him on the various classes of goods he buys. This is not only that he may have all the figures before him and select the lowest price, but also that he may watch the variations in prices from month to month. This whole record may be kept on one small card.

On the face of this card is entered the name or description of the article. Columns are provided,, first, for the name of the concern making the price, date the quotation was made, price, terms (discount, time and so on), shipping terms (freight rates and facilities). the minimum amount which must be ordered to secure the price, and for remarks regarding the house or goods; then a column is provided for possible orders, and columns for the date, amount and price of any orders given. This card can be made to hold about twenty quotations. If any concern changes its figures, the first figures can be erased or a line drawn through the first quotation and a second entry made.

The reverse of this card can very conveniently be used for keeping an index of catalogues. The name of the catalogue, the date issued, its catalogue number and its shelf number are the only entries necessary in each case.

Attractive Window Display made by a Plumbing Firm at Lewiston, Me.

Steam Heating in Practice

Article II.—Heating a Business Block.

By W. B. MacKay, Toronto.

Frequently in towns and cities buildings are erected to be used for various purposes. One of these business blocks or apartments is shown in the accompanying floor plans. This block embodies three features—stores (to which we gave attention in The Plumber and Steamfitter of May 1), offices, and living apartments.

The first step toward determining the amount of radiation for each separate apartment is to acquaint ourselves with the amount of exposure, the direction or directions of these exposures, the usual temperature outside in winter and the temperature required inside, together with the general condition of the building. This building is somewhat similar to the last example, as it is located between two other buildings which do not completely shield it as was the case with the hardware store. Portions of the side walls are left exposed, as the adjoining buildings do not extend to the same depth as the buildings we have laid before us. The front faces towards the west, the exposure at the side and rear toward the south and east respectively.

This building is of brick construction with a flat roof, and is in splendid condition. A good basement is provided under the whole of the building, as shown in the floor plans.

Heating the Store.

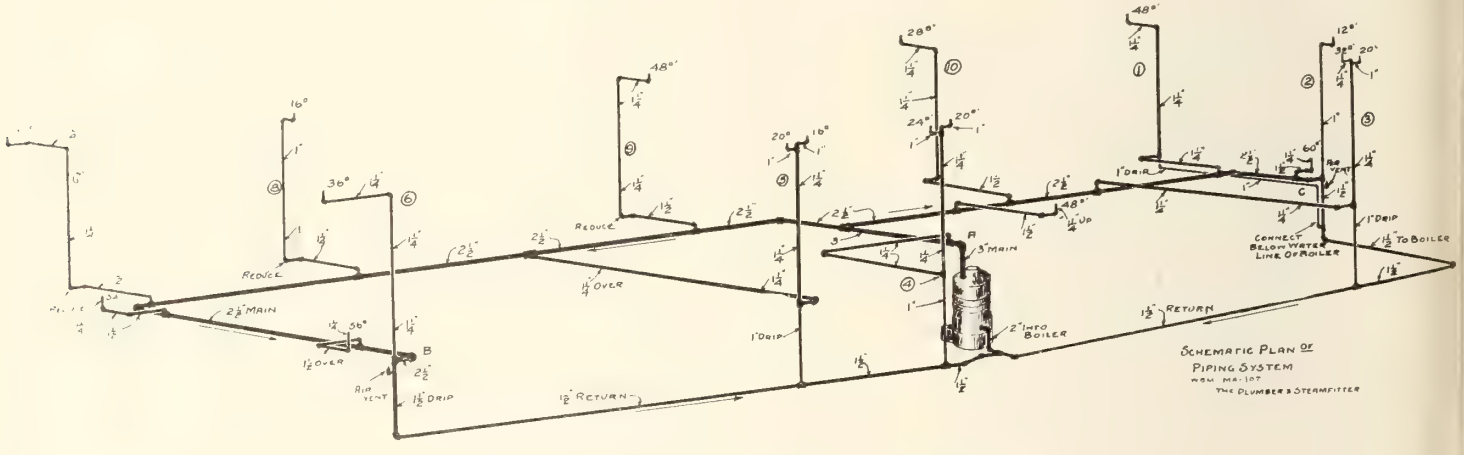
The first apartment to which attention should be drawn is the store. This store has, approximately, 21,000 cubic feet of contents, 350 square feet of glass surface and about 850 square feet of exposed wall surface. The front is practically all glass, the rear is exposed, as shown, from (A) to (B).

According to usual practice, 180 square feet would be required to give 65 degrees at zero outside, with no allowances for cold rooms or hallways lying adjacent to this store, which, in this case, should be about 10 per cent. for the cold hallway, making the amount of radiation for the store at 0 degrees practically 200 square feet, or 1 square foot of radiation to every 100 cubic feet of contents. Furthermore, the fact must not be overlooked that this store faces toward the west and should be supplemented still further. In this instance, as the buildings are high on the opposite side of the street and protect the front of this store to a great extent, 10 per cent. is sufficient. The eastern and southern exposures have already been considered, so that for zero a proper amount of radiation for this store would be 220 square feet, or 1 square foot of radiation for every 95 cubic feet of contents.

Before considering any other room or apartment it is worthy of notice to take into consideration what would be required to maintain 65 degrees at 10 degrees below zero instead of at zero, as was the first case cited, on a basis of the exposed wall surface, glass surface and the cubic contents. The store would now require about 210 square feet of radiation and with the allowance made as stated in the preceding paragraph would be about 250 square feet, or 1 square foot of radiation to every 85 cubic feet of contents.

From this last calculation it is safe to say that for 10 degrees below zero about 15 per cent. more radiation is required than would be required for the same room or apartment at zero. Going a step further in the same direction, at 20 degrees below zero 235 square feet of radiation would be required plus the same allowances as in the other two cases, which would increase this amount to 280 square feet, or 1 square foot of radiation to every 75 cubic feet of contents, about 27 per cent. more than would be required at 0 degrees for 65 degrees. It is assumed that 0 degrees is the lowest temperature to be considered, but frequently in our northern climates much lower temperatures should be taken as an average, as, for instance, 10 degrees, 20 degrees and 30 degrees below zero, and when these conditions are to be met a considerable amount more of heating surface will be found necessary to maintain the inside temperature at a proper degree, and it will be the endeavor to exemplify how these conditions can be met at any given temperature.

As regards the division of the radiation into radiators, the same methods may be adopted as in the case of the hardware store—the radiation should be placed at the coldest points or exposures—the front of this store, therefore, needs to be well taken care of. The large amount of glass surface and the opening and closing of the street door makes this a factor requiring fully half the radiation estimated for the whole store. Therefore, 110 square feet of radiation may be placed as near these exposures as possible.



Steam Heating in Practice.—Plan of Piping for Business Block.

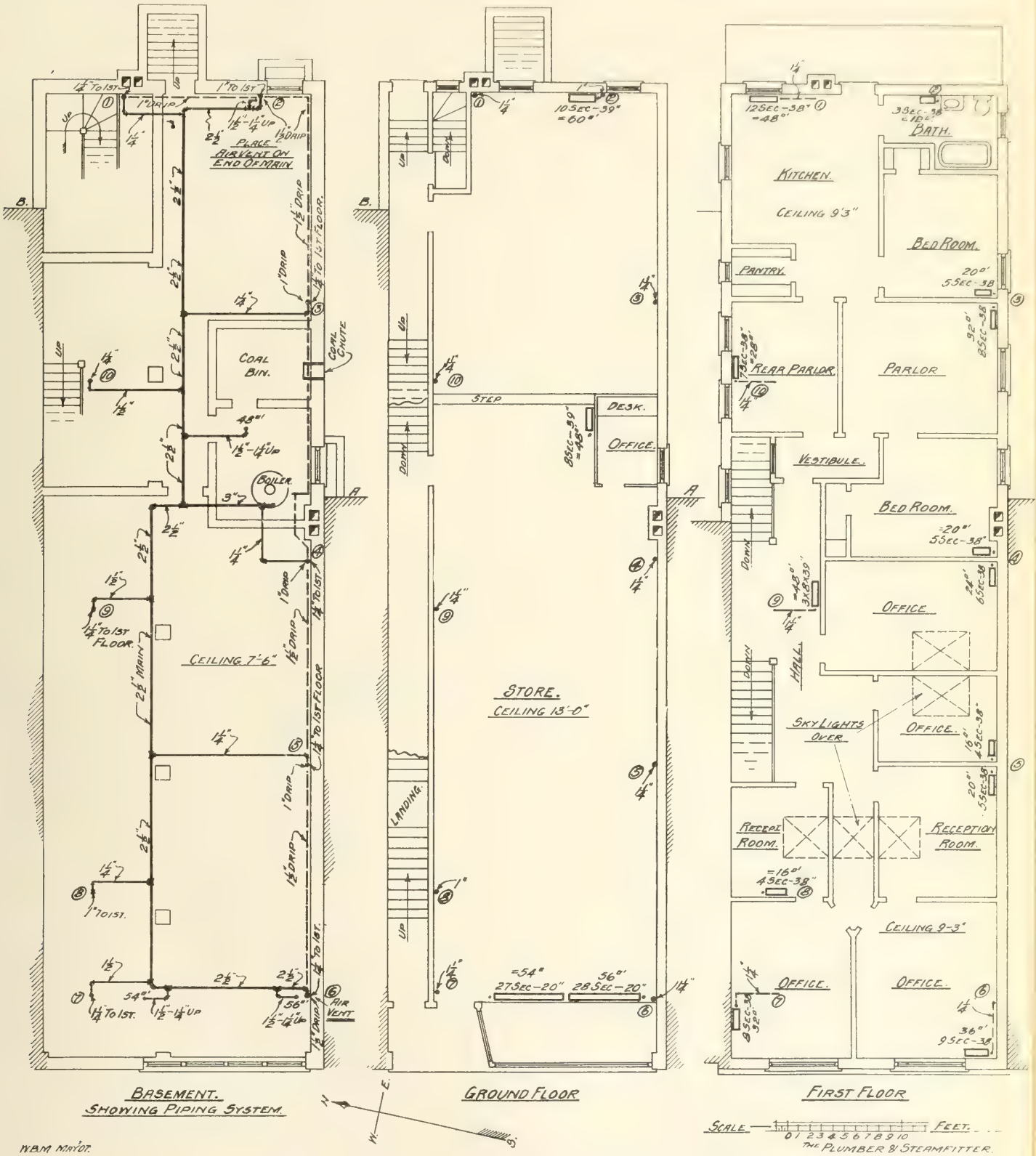
Placing the Radiators.

The floor of the display window is raised sufficiently to accommodate a radiator twenty inches high, the width of which is limited, but, according to the dimensions of the window space, we have sufficient length to place a two-bar type, 20 inches high, which will spread the radiating surface over the entire window space. A point here arises that will be worth noticing—110 square feet in 20-inch, two-bar type, would amount to 55 loops, a radiator of such dimensions (11 ft. 4 in. long) would be impracticable on account of its unsuitable construction and length. Again, a radiator of 55 loops would be of very little use on the one pipe system on account of preventing trouble arising from the condensation and air that might lodge therein. This may be overcome, however, by dividing this amount into two

radiators and feed from opposite ends, as shown on the plan. The remainder may be divided up and located about the store as indicated.

The rooms or apartments that should have attention next are the offices at the front over the store. Each has one side exposed to the west with a very large proportionate amount of glass surface. The space over these offices being in contact with the roof, has a cooling effect also. Then in the north office of the two considerable of the floor itself is exposed to the outside—this will be observed on the plans, the first floor projecting out over the open space in front of the street doors; so that for 0 degrees and 70 degrees one square foot of radiation for every 40 cubic feet of contents would be required for these offices, including allowances for the extreme conditions.

The two reception rooms, and the two offices located, as shown on the plans, to the rear of the offices just mentioned have no outside wall exposures, but have skylight and roof exposures, which practically amount to the same thing. In these particular instances, 1 square foot to every 55 of cubic contents gives



Steam Heating in Practice—Heating Store, Office and Living Apartments.

very good satisfaction. The commercial sizes of radiators are marked on the plans to correspond to these calculations.

The Living Apartments.

The living apartments of this building need to be considered in an entirely different light from the balance of the building, as the greatest heating requirements are of a necessity the greatest at a time different from the portion of building used for business purposes. The rear parlor, for instance, in all probability would be used also as a dining room, and it should be well heated. One square foot to every 40 cubic feet of contents is a fair amount, this to include allowances for the northern exposure, roof space, etc. One square foot to every forty-five of cubic contents would be ample for such a room as the front parlor. Bedrooms or sleeping apartments do not require quite the amount of radiation as in the case of living rooms, one square foot to every 50 cubic feet is abundant for such rooms as are indicated in our example.

The bathroom is a type of a room of small cubical contents, with proportionately large amount of exposure and requires to be well heated. It will be found that one square foot to every 35 of cubic contents should be used for rooms of the requirements similar to this bathroom.

These various apartments have been treated very briefly, but the preceding figures may be useful as a guide in figuring similar examples, a summary, therefore, amounts to the following :

The Figures Summarized.

For stores a variation of from one square foot for 100 cubic feet of contents to one square foot for every 60 cubic feet.

For offices, one square foot for every 60 cubic feet, to one square foot for every 40 cubic feet of contents.

Living rooms, with small exposures, one square foot for every 60 cubic feet to one square foot for every 50 cubic feet of contents. With two exposures or large amount of glass, one square foot to every 50 cubic feet to one square foot to every 40 of cubic contents. With three exposures and large amount of glass, one square foot to every 40 cubic feet, to one square foot to every 35 cubic feet of contents.

Bathrooms or small exposed rooms, one square foot to epery 40 cubic feet to one square for every 35 cubic feet of contents.

Sleeping rooms, one square foot to every 60, to one square foot for every 60 of cubic contents.

The above will be of value in ordinary practice, remembering, of course, the figures are for zero temperatures outside. If other temperatures are to be met corrections must be made accordingly.

The Piping System.

The piping is laid out to suit the requirements of this particular building, also the distribution of the radiators. The plan somewhat resembles the one laid out in the last example, it being well adapted to long, narrow buildings.

The piping has been carefully indicated, together with the sizes, on the plans, the risers being numbered to identify them on each floor plan. The system as laid out adheres closely to usual practice.

The ample use of the drip pipe, the carrying fair-sized mains to the remotest points in the system, help materially in the operation of any steam heating plant. The difference in cost between a poor system of piping and a good one in the way of increased sizes of pipes amounts to so very little that it is hardly worth while considering. In many cases the cost of changing the dies to cut a smaller sized pipe would be more than the increased cost of running the pipe on the full size.

The running of mains of ample size throughout will enable one to install a system wherein the pressure is much more equally maintained throughout the entire system than is frequently met with. There is always a certain amount of loss due to friction and the smaller the size of the pipes the greater is the proportional amount of this loss.

Quite frequently due to this cause water is found at the air vents attached to the radiators. Usually radiators are attached to the main at a point close to where the long run of main joins the return pipe that are so affected. Drip pipes of ample size should be provided at intervals in long runs of piping to relieve the main of condensation, and particularly where reductions in the size of pipes have been made, thus preventing any trap in which water may lodge.

Methods of Dripping.

Long branches off the mains are also the better for a drip on the end to bleed the condensation into the return, rather than carry it via the same horizontal pipe back into the main again. Such an arrangement is practically on the two-pipe system, excepting that only one connection into the radiator or riser is used. Short branches should be carefully graded so that the condensation may flow back easily and noiselessly into the main. It is good practice to carry these branches over to the heel of the riser or stub one pipe size larger on the horizontal than is required on the vertical. Illustrations of this are to be found in the piping plans of the example chosen. The opposing directions of the flow of the steam to the radiators and the condensation returning in the same pipe make it necessary to have piping, especially large sizes, in comparison with piping dripped in such a manner as to have the flow of the conflicting elements (steam and water) in the same direction.

A safe and simple rule in determining the sizes of the branches off the main to feed a radiator or radiators is to follow the schedule of tappings standard for one-pipe steam heating :

One square foot to 25 square feet—1 inch tapping.

25 square feet to 60 square feet—1¼-inch tapping.

60 square feet to 100 square feet—1½-inch tapping.

Over 100 square feet—2-inch tapping.

Thus for example we have a 48 square feet radiator located close to the main (within 8 feet) carry over from the main with plenty of pitch (one inch in 10 feet being ample) a 1½-inch pipe to the heel of the vertical stub, which need be only 1¼-inch. Another case is of a 28 square feet radiator quite close to the main, 1¼-inch pipe carried throughout would be sufficient.

The carrying capacity of a main may be determined roughly by multiplying the diameter or size by itself and multiplying the result by 100. For instance A 3-inch main would carry or supply 3x3x100, or 900 square feet of radiation; a 2½-inch main, 2½x2½x100, or 600 square feet of radiation. Above three inches the carrying capacity increases more rapidly, while below three inches the capacity decreases. This is due to the friction being proportionately larger in the smaller sizes of pipes.

Valves Required.

The only valves required on a single pipe, long-pressure steam heating plant are the radiator valves, no valves being required on the mains or return pipes except in special cases. Where it is desirous of shutting off a part of the building, which is only being heated intermittently, it is proper to use gate valves on the flow and return to cut off that section. The type of radiator valve most used at the present time is the Jenkins patented disc angle radiator valve. The disc of this valve is a removable one and can be replaced when worn.

It is of importance to have valves of such types as will offer the maximum area to the steam and in no way obstruct the flow of either or the water of condensation.

In a future article the question of piping and sizes of mains will be taken up in further detail.

AMERICAN HEATING SYSTEMS FOR BRITAIN.

In an interesting article, entitled "American Heating Systems for Britain," published lately, will be found a number of facts worthy of serious consideration by the Canadian manufacturer of heating apparatus.

The fact that what the author says is not new and has been said before does not, to our minds, detract in the least from its importance as a fact well worth continued repetition.

We, on this side of the Atlantic, may congratulate ourselves that we are unable to wholly appreciate the vivid picture of the snowstorm and cosy interior which the author depicts—fully appreciated, however, we believe, by our British cousin. After dwelling at some length upon the storm raging outside, the author goes on to say:

"Inside the place seems cosy enough. The walls are covered with a striped paper, warm in color and cheerful in design. There are several easy chairs upholstered in red chintz, and the floor is a greensward of heavy Brussels carpet. Over there is a wide, old-fashioned open fire-grate, in which glows about half a hundredweight of coal surmounted by a log. The picture seems promising enough. But come and sit at the table here for ten minutes. Well, how do you feel now? Do you notice a weird something that begins to haunt the mind and creep stealthily over the body? Draw a little nearer this cheerful fire. Put on your overcoat and, if you have them by you, throw a rug 'round your shoulders and another over your legs. The place is still like a well and the atmosphere that of a tomb. And why? The fact is, that cheerful, glowing open fire is laughing at us; de-

civing us into the belief that it is there to make us warm and comfortable.

A Warm Roast.

"If we get right close up to it—almost into it—we shall be warm enough in very truth. Roasted, broiled, toasted and grilled, in fact. But with this important qualification, that the cooking will be like that of the Frenchman's toast, on one side only. The face and legs are burning, but down the spine we seem to feel the touch of a frozen finger, and an icy blast whistles and blows round the ears.

"The heating of the room is all wrong. The wide open chimney swallows up, in its great stony throat, the bulk of the heat which should go to warm the room. Whatever fresh air is supplied must come under the door, or through the cracks in the flooring. Open the windows, and in a second the room becomes an ice chest, and, likely as not, immediately fills with dust and coal-gas."

A powerful indictment against the open fire has recently been preferred by a well-known English doctor. He point out that, from a hygienic point of view, the open fire is quite wrong. "It will not burn properly unless there is a strong draught in the room, and the consequence is that those sitting near it are never thoroughly warm unless the air they breathe is impure."

He says that people seem more liable to colds every year, and, in a large number of cases the ailments can be traced to the use of open fires and improper ventilation. Children playing on the floor are particularly affected, for it is near the floor that the draught is always strongest. Open fires also vitiate the atmosphere, and he is of opinion that it will be a good thing when they vanish.

The following, according to the article, are among many reasons why different means of heating should come into favor in Britain: Economy of fuel; less cost of maintenance; no dirt, except in basement; no smoke; no damage to curtains and decorations of rooms; no constant carrying of coals upstairs, because with improved means of heating, fires require attention only once in twenty-four hours, and an even temperature is maintained automatically.

Opportunity for Business.

The foregoing facts should set those whose business is with heating systems and heating apparatus thinking seriously about the prospect abroad. The reform in heating is a matter which must be accomplished eventually. And there is no one in the world more competent to bring about the change than the Canadian who has studied the matter of heating so thoroughly.

The heating apparatus demanded by the circumstances, suggests the article, as reported in the Engineering Review, includes basement furnaces, steam, hot-air and hot-water radiators, with their accompaniments, electric and coal stoves for rooms and halls, registers, etc.; and the fact must be borne in mind that in England soft coal is the fuel used everywhere, and that, with the exception of a short summer, a fire seems to be necessary to real comfort the year round.

SOLUTION OF A PLUMBER'S PROBLEM

Written for the Plumber and Steamfitter by W. Holley, Montreal.

The great need, as well as the great lack of technical education, is an acknowledged fact in this country and very frequent instances in actual practical work are met with which clearly demonstrate that fact—instance, a knowledge of the most rudimentary scientific principles would have made impossible. If this country is to develop on all sides in the same ratio as her population and importance, it is necessary that much more attention be given to the study of mechanical work from a technical standpoint.

An instance of lack of knowledge of rudimentary principles of hydraulics and water pressure which was recently noticed, is worthy of attention here.

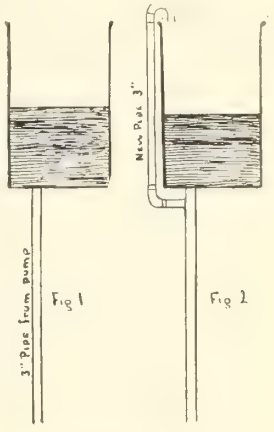
A tank to hold 10,000 gallons of water had been erected by a firm of competent pump makers to supply water to a series of buildings in the country. The tank was erected high above the buildings on a stand, and the water was forced up into it by means of a hot-air engine, entering the tank through the bottom by means of a three-inch pipe. (Fig. 1.)

After some time, difficulty in raising the water to the tank was experienced by those in charge of the plant and a plumbing contractor in the nearest town was informed of the matter. After examination, he decided that the difficulty was due to the water entering the tank through the bottom, it being next to impossible to force the water in against the pressure of the water already in the tank, this difficulty increasing as the more water entered.

The result was, he put a tee into the supply pipe just below the bottom of the tank at "a," and brought another three-inch pipe from this point up the outside of the tank and over the top edge, so that the water would enter from the top and not against the pressure of the water in the tank. (Fig. 2.) He did not think it necessary to plug up the opening at the bottom of the tank, but left it just as it was originally. The pump was started, and he was much more than surprised to find that no water entered from over the top, but continued to come in from the bottom, in fact, water never did enter from above, even when the tank was full. His theory was, that the great weight of the water in the tank made it very difficult for more water to enter from below, but by runing a pipe up the outside the incoming water would escape the great pressure. No doubt there are others who have had similar theories.

The explanation is this. The pressure of water on the bottom of any receptacle is the same for every square inch where the depth of water is the same. This pressure is entirely due to the amount of head or height of the top of the water from the bottom of the receptacle. This applies whether the vessel is 20 feet in diameter or only six inches; so the pressure on the opening of the pipe at the bottom of the tank would be the same, approximately, as the pressure exerted at the same height by the water above in the three-inch pipe up the outside of the tank. The pressure is due to the head of water above, and is the same per square inch, notwithstanding the size of the receptacle.

There is another feature which enters into the question—the friction in the pipe. The loss of force due to



friction as water passes along a pipe gets very much greater as the size of the pipe is decreased, so the friction caused by the water being forced up the pipe on the outside of the tank would play some part in the question of the water entering the receptacle. Safe it is to say, that the friction in this pipe would cause a greater obstacle to the water passing along than would the volume of water in the tank to the incoming stream finding in its place and increasing the head of water in the tank.

Had it been closely examined when in operation it would have been found that the height of water in the pipe outside the tank was not quite that of the height of water inside the tank.

VALVES AND FITTINGS.

The Crane Co., Chicago, has issued a revised complete pocket catalogue containing cuts of and information about valves, fittings and various kinds of engineering specialties. This compact and handly little booklet may be had on application to the company if The Plumber and Steamfitter is mentioned.

PARAGRAPHS OF INTEREST

By C. E. Oldacre, Toronto

The Care of Valves.

A well working self-opening and self-closing air valve for steam radiators is very essential to the proper operation of a steam heating system, as much depends on the certainty with which the air is released from any or all radiators that may be in use. Unless the air valves open and close rightly there is little chance for the successful operation of the plant and are very often the cause of serious complaint against the whole plant.

Tampering with automatic valves by inexperienced attendants is too frequently found. Any of these valves that require setting should be rightly set and then left severely alone. Very often in setting they are set up too tight, so that when the steam is down they will not open as they should. And, again, some seem to think if the steam does not hiss out of the valve in volumes the radiator will not heat.

Especially in hotels, air valves receive very poor treatment, and then the boiler or the whole job is blamed for the shortcomings due to the ignorance of inexperienced help or of others.

Some Causes of Trouble.

I have seen frequently, when the air valves in hotels and elsewhere could not be tampered with in any other way, that they would be unscrewed from the radiator and ten chances to one wrongly put back in place—cross-threaded, not screwed up tight, or may be put on upside down.

How can good service be had under such conditions? Some one should get up a good reliable valve that is beyond putting out of order, and one that can not be removed.

One of the best valves, and quite inexpensive, is the Jenkins valve, and which is very dependable when once set, and which is not very readily removed without tools, is too often rendered useless through just such tampering as has been mentioned. A number of the large float type are also reliable in their operation, but, due to their size, present quite a leverage and are entirely too easy of removal and then bad replacing, as has been cited.

The use of good, large automatic air valves on the end of the return main just before it drops down to the boiler is of great benefit to the steam circulation in the mains. One or more of these valves on the return is of great advantage, and will assist in the more even flow of the steam.

Concrete Heating Problems.

With concrete construction coming into vogue for pretty nearly all classes of buildings, new problems in heating are presented to the heating contractor.

In one form or another, it may be looked forward to to meet with much favor and become one of the accepted forms of building construction.

It has many things in its favor other than its great quality of being fireproof, with its attendant of a low rate of insurance. Concrete buildings are easily adaptable to the most artistic treatment from an architectural view-point, as has already been exemplified in many cases.

Concrete dwellings and cottages have been erected in many cases as cheaply as ones of timber or other usual types of construction. Of course, to-day, the relative cost varies greatly according to location and various local conditions.

But, taking a broad view of the matter, one must recognize in the light of the increasing price of lumber and the constantly decreasing supply that the concrete construction is sure to occupy a very prominent position in the building world. From an economic standpoint it is a very wise provision that it is meeting with such rapid advancement and wide favor in the eye of the general public.

To the plumber and heating contractor its presents many problems to be solved, and the exigencies of the different cases must be readily and promptly met, suiting the work and the entire lay-out to the various conditions arising.

Plan Location of Fixtures Early.

It is quite necessary that provision shall be made when the plans for the building are laid out, for the correct running of all risers, mains and branches as well as the definite radiator locations.

Much tedious and expensive cutting is avoided in this way, as ferrules made of sheet iron can easily be provided and embedded in the concrete as the building progresses, allowing for all lines of piping passing through floors, ceilings and partitions.

It may be conservatively said that a concrete wall that is not strapped or furred and plastered will have a cooling effect on the enclosed space 30 to 50 per cent. in excess of a brick wall that is strapped and then plastered, varying, of course, according to thickness of walls.

Some have spoken of concrete walls not being moisture proof, yet it is quite likely that bare concrete walls have been compared with brick walls furred and plastered, so that the comparison is hardly fair.

Heating the Top Flat.

Some concrete buildings are constructed with concrete roofs, and where such is the case the ceiling of the top flat should be ceiled down with suitable material providing an air space between ceiling and roof, or quite a considerable amount more of heating surface will be required to bring the top flat up to a proper temperature.

Lately, in looking over a large printing office in a concrete block, where the whole top flat is occupied with presses, this was particularly brought to the writer's notice. It is necessary in this case that steam shall be kept up continuously 24 hours a day during the colder weather that the proper temperature may be had during the working hours of the day or otherwise the rooms would be too cool—not so much insofar as the bodily comfort of the workmen is concerned as that the inks used will be of the proper consistency to work, and the finished matter will dry in a reasonable time. It is easy to note the greatly added expense here for maintenance, if a quite inconsiderate outlay had been made in the first place for ample radiation to meet the conditions or had the walls and ceilings been strapped and plastered or otherwise rendered of a less heat conducting capacity.

Chimney Draft Problems.

Poor draft, due to improperly constructed chimneys, is responsible for many poor working heating plants—as well as for the condemning of many otherwise good working ranges. It is fair to say that more ranges give trouble from this cause than any other—yes, from all other causes put together. Some persons have an idea that ranges and boilers have a good or poor draft within themselves—that is, the draft is due to the range or boiler itself. Such is absolutely not the case. The intensity of the draft is simply a question of the velocity with which the heated gases pass up the chimney, and the volume, with any determined velocity, is dependent on the area or size of the chimney. The draft depends on the difference in weight of the heated column of air inside the chimney and that of the air outside of the chimney—the higher the chimney and the hotter the gases passing through the chimney, the greater the draft.

No chimney used for heating or cooking apparatus should have any other opening than that for the particular cooking or heating apparatus for which it is intended to be used.

Chimneys passing through interior walls or partitions will be found to work better, as a rule, than those constructed as part of the outside wall, and will be less subject to down-drafts, as the walls of the flue are kept warmer.

Lining Flues With Terra Cotta.

The practice of lining flues with terra cotta or tile lining is a good one, as it provides a smooth, frictionless surface on the interior of flue, and makes surer a tight chimney. Such tile linings are to be had in all required sizes. No flue should ever be built less than 8 x 8; larger sizes being used according to requirements. The nearer round the flue the better it will work. Flat, narrow flues should be avoided in every case as they are quite likely to give trouble, especially in outside walls. Changes in sizes and shapes throughout their course should also be avoided. If a flue is started 9 inches by 12 inches let it remain of these dimensions all the way to the top of the chimney.

Offsets and horizontal runs in flues should be strictly avoided they form good places for soot to lodge, that are sure, sooner or later, to give trouble, to say nothing of the falling mortar and

other debris during the process of erection.

Two Handy Tools.

An altitude gauge and a hot water thermometer are valuable adjuncts of all hot water heating plants; in fact, they are most essential. An altitude gauge placed at the boiler at all times shows just where the water stands in the system and avoids the necessity of running to the expansion tank, which may be in some out of the way place, and prevents forgetting to see that the entire system is properly filled, as a stop can easily be placed near the boiler that permits of its being filled in the cellar or basement. A hot water thermometer will prevent many a complaint as well as help one to operate the heating plant with the greatest satisfaction. With any given amount of radiating surface the amount of heat given off by radiators is dependent on the temperature of the contained water, and the thermometer will help greatly to graduate the temperature of the water according to the weather conditions. A thermometer will, in many cases, call the user's attention to the reason that he is not getting the required temperature in the rooms or building. It will show him at once, though he may have an apparent good fire, that it is only a surface fire and that there is no body to it—the major portion of the firebox being filled with ashes. Once a user accustoms himself to running his hot-water heating plant at certain water temperatures according to the weather conditions prevailing, he gets the greatest satisfaction from the apparatus and saves much fuel and bother, and his satisfaction with hot water heating is greatly increased.

Corn Cribs Hard to Heat.

Too many houses to-day are too flimsily constructed—it is almost fair to say they are thrown together. In most cases if the house is cold then the heating contractor and his heating system is blamed for all the shortcomings, when, in fact, it may have nothing at all at fault if the construction was reasonably normal. The work may have been done ever so well and the entire system well and properly laid out according to the best practices of the trade. You cannot heat a corn crib, but this is what seems is expected in some cases.

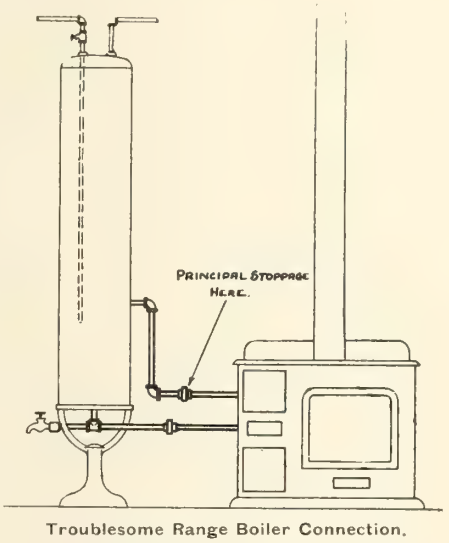
Again, you may often hear people remark that they burn so much more fuel to keep their house warm than someone else does, even though the other person's house is the larger, and this may be all due to the quality of the construction and yet it will be blamed on the heating apparatus nine times out of ten.

Lay System Out Carefully.

Too much care cannot be exercised in the laying out of a heating system, according to the best practices of the trade, making due allowance for all exposures and conditions that can be foreseen, but, even at that, many abnormal conditions, particularly due to careless construction, are liable to arise, against which the heating contractor cannot provide, and should not be expected to do so. One of the most economical ways to heat a house is to build it so it can be warmed.

Everyone recognizes the benefits of well-fitted double windows, and at the same time should also recognize the benefits likewise of a reasonably tight construction—particularly around doors, door frames and window frames.

The furring of outside walls should be so done that a confined air space is formed. Dead air-space is a valuable non-conductor of heat, but if the stripping or furring is done so that there is a moving column of air between the plaster and wall then a great deal of heat is wasted. Attention to many of the small details that add a very trifling amount to the cost of the construction upon the part of the builders would save considerable sums for the users of heating apparatus.



Troublesome Range Boiler Connection.

TROUBLESOME RANGE BOILER CONNECTION.

By C. E. Oldacre, Toronto.

A range connection that gave the owner considerable trouble is shown in the sketch given herewith. There was a complaint that very little hot water could be had at any time, even when the fire was very good, and that when a hot water tap was opened there was a great deal of cracking from the boiler, which was not only noisy, but inconvenient.

It was found that the circulating pipes were hot up to the unions and only lukewarm from that point, and that the boiler was only barely warm even at the top. This at once indicated a stoppage in these circulating pipes and most likely near the unions.

The pipes were taken apart, and though they were ¾-inch black iron, it was found that the opening in one of the pipes was scarcely over three-eighths of an inch in diameter. The sediment had gathered in the pipes in a very irregular way, being greater at some points than others, and the greatest near the unions. The range and connections had been in use little over two years. It was found that the greatest accumulation of sediment or deposits of mineral matter takes place in the pipes where there are fittings that restrict the water or change the direction of the current.

To rectify the trouble new circulating pipes of galvanized iron 1 inch in diameter were used, which would not permit the accumulation to take place so quickly, and when this was done no further trouble was experienced, as the circulation was free and rapid.

The tube carrying the cold water to bottom of range boiler was corroded on the outside about two feet from the top and was nearly eaten through, though it was of the usual ½-inch galvanized iron.

CORNER STONE LAID.

Last Monday the corner stone of the King Radiator Company's new plant on St. Helens Avenue, Toronto, was laid, a number of prominent men connected with the company being present. R. J. Cluff officiated at the ceremony and announced that in a few weeks' time radiators would be turned out by the 200 men who are to be employed.

The buildings comprise a machine shop 258 x 107 feet, a foundry 210 x 107 feet, and a core shop and cleaning room 162 x 50 feet. They will be constructed of indestructible sand lime Swansea brick, of which 1,250,000 will be used. The construction includes gigantic steel trusses, which span the entire building, and which add much to the appearance of the building and to the absolute prevention of danger from fire. The expenditure upon buildings alone will be $150,000.

The architect is F. H. Herbert, who will also prepare plans for the model dwellings. The officers of the company are J. C. King, Montreal, president; Fred Somerville, vice-president; R. J. Cluff, managing director, and L. Payette and W. J. Cluff, directors. The Messrs. Cluff and Fred Somerville represent the Toronto capital invested, and they received many congratulations upon the progress made in this enterprise.

To the north, along the railway track, will be erected the plant of the Somerville Brass Works, which will comprise a foundry, finishing shop, lead pipe works and a boiler room and electrical works and radiator plant.

Adjoining the two works a plot of land has been secured on the opposite side of St. Helens Avenue, on which it is planned to erect a number of workingmen's homes.

WATERWORKS CONVENTION IN TORONTO.

Preparations are well under way for the convention of the American Waterworks Association, to be held in Toronto from the 17th to the 22nd of June, inclusive.

Seven hundred delegates will be present and it is expected that fully two-thirds of them will be accompanied by their wives or daughters. The following form a committee and are making complete arrangements to entertain the visiting delegates in a manner worthy of the Queen City: Third Vice-President Alexander Milne, superintendent of waterworks, St. Catharines; J. M. Allan, Canadian Fairbanks Company, Toronto; Willis Chipman, consulting city engineer, Toronto, and C.

L. Fellowes, deputy city engineer, Toronto.

Among other things, the committee are planning a moonlight excursion on the lake. The civic reception committee will also lend a hand at entertaining the delegates.

Subjects of interest to waterworks engineers will be discussed at the convention and numerous displays of waterworks supplies will be placed on exhibition by the different manufacturers in those lines. The convention met last year at Boston.

NEWS OF THE TRADE IN CANADA

Vermette & Houle, Montreal plumbers, have dissolved partnership.

Alex Landry, plumber, St. Celestin, Que., has made an assignment.

Geo. A. Wooton, plumber, Halifax, N.S., is making extensive improvements in his premises.

Robert Huddleston has opened up a tinsmith and plumbing shop on Front street, Belleville.

E. F. G. Hustubise, Chas. Page and Henry Montpetit have been registered to carry on a plumbing business in Montreal.

Wm. Conrad, Waterloo, and Fred. Bailes, of the firm of John Bailes & Son, Oshawa, were visitors in Toronto this week.

F. S. Collocott, Yorkton, Sask, has disposed of the plumbing and tinsmith part of his hardware business to Parrott & Myers.

E. L. Higginbottom, of the plumbing firm of Higginbottom, Anderson & Sime, Fort William, passed through Toronto on his honeymoon last week.

O'Gorman & Hemphill are two young men who established themselves in the metal and plumbing business at St. Catharines, and are growing in favor as time passes.

McKelvey & Birch, Kingston, are rebuilding their premises, destroyed by fire a few weeks ago. They are temporarily located on the opposite side of Brock street.

James Purvis, Sudbury, has disposed of the plumbing and tinsmithing department of his hardware business to Wm. Grant, formerly with F. Cochrane & Co., Sudbury.

The death of Mrs. Watt, wife of Robt. A. Watt, hardware merchant and plumber, Brantford, occurred in that city a week ago. The deceased was thirty-seven years of age.

A citizens' committee has been formed at Chatham to ensure the passage of the by-law granting aid to the Wolverine Brass Manufacturing Company, who propose to establish a plant at Chatham.

The International Heating and Lighting Co., Cleveland, Ohio, have secured an option on a site at Portage la Prairie and will begin the erection of a gas plant as soon as the deal can be put through.

Plans for a two-storey brick factory 50 x 150 feet have been approved by the Canadian Brass Manufacturing Company, Galt. It is expected that building operations will be proceeded with at an early date.

F. Rogers, formerly employed in J. W. Fleming & Son's hardware establishment at Blenheim, recently met with a bad accident at Windsor through falling from the roof of a building on which he was engaged in tinning and plumbing work. He is now in the hospital at Windsor.

George Blake, master plumber, St. John, N.B., has returned from Los Angeles, Cal., where he was attending the convention of Mystic Shriners. Mr. Blake was on a train that was just eight minutes ahead of the train that was wrecked and in which thirty people were killed.

The heating of the new House of Refuge at Belleville has recently been completed by the firm of John Lewis & Co., and has been pronounced by the architect as first-class. This firm also put in the new steam heating plant in the court house county buildings, as ordered by the Government inspector.

S. G. T. Cruickshank and H. M. McAlpine, formerly with the Labatt Manufacturing Company, London, have moved to Toronto, where they both have accepted positions, the former in the head office of the British American Oil Company, and the latter with the James Robertson Company, plumbing supplies.

The death occurred at St. Stephen, N.B., a week ago, of William Donovan, a well known plumber. Mr. Donovan was born in St. John, N.B., 48 years ago and learned his trade with George Blake of that city. He went to St. Stephen several years ago and soon established a successful business. He leaves a widow and an adopted son.

An article for which there is great demand in Galt is the gas stove. Since the inception of natural gas, which costs but 35 cents per thousand feet, compared with the artificial gas at $1.50 per thousand, the natural article has been installed in almost every house in Galt. It is estimated that there have been fully five hundred gas stoves sold in Galt during the past two months.

By-laws granting exemption and land to the Stanley Lead Company, Toronto, and the Grey & Hedley Zinc Company, on smelters to be established at Kingston were carried by the ratepayers of the Limestone City on Monday. The two companies will use part of the city's water lots below Cataraqui bridge. Buildings to cost $140,000 will be erected, and work will start at once. Lead and zinc will be received from the mines in North Frontenac, within easy distance of Kingston.

M. M. O'Connell, plumbing inspector of the city of Ottawa, has resigned, it being his intention to go into the plumbing business on his own account. Mr. O'Connel, who has been inspector for 3 years, was the first to fill the office and in that capacity he has done good work. The fact that the standard of plumbing has been raised and household sanitation improved is in a considerable measure due to his effort. James N. Jacques has been appointed to the vacant position at a salary of $1,000 per year.

The new plumbers' brass foundry at Galt, in which Scott & Bennett, master plumbers, are largely interested, has commenced operations. The first cast was made last week and was most satisfactory. A number of men are being steadily employed, and the outlook for the new industry is exceptionally bright. The company will, it is expected, move into larger quarters in the near future. "We are perfectly satisfied with the future prospects of the new industry," said Mr. Bennett, when asked his opinion regarding the outlook.

The McEachren Heating Company, Galt, have just about completed the installation of a new heating system in the Woodstock Collegiate Institute building. Some time ago the contracts for the re-modelling of the building at a cost of $20,000 were given, the McEachren Company securing a $3,000 contract to install their heating system. It has been in operation for some time past, for the heating of the school, and is giving satisfaction. With the McEachren system, the hot air is propelled from the furnace into the rooms by means of fans. It enters into the rooms midway up the walls, and forces the foul air downward, and out the ventilation shafts. It is the first system of the kind to be installed in Woodstock, and its first trials were awaited with a good deal of interest.

WESTERN TRADE NEWS.

Saskatoon, May 30, 1907.—Quietness still reigns in the plumbing trade, but plumbers are looking forward to some activity in the near future. The trade is but in its infancy and is likely to remain a helpless weakling until the city wakes up and instals a sewer and water system. It is gratifying to note that at a recent meeting of the city council a resolution was passed favoring an extension of the waterworks in the vicinity of Twenty-first Street as far as St. Paul's Hospital. This extension will no doubt take place soon and will pass through a fast growing district which will enable property owners to make connections, and be in readiness as soon as an adequate supply of water can be found. At present only a small area of Saskatoon is supplied with sewer and water pipes, but something will have to be done in this direction at an early date or the city will be up against a serious proposition. We are growing fast, it is true, but the sanitary conditions ought to be one of the city's first considerations. It is a disgrace to any city that it should have to depend on the soup-like substance taken from the river for its water supply which has to be boiled and filtered befare being fit for use. Hundreds of thousands of dollars will be spent here this summer and contracts are being let. Building materials are not coming to hand, however, as promptly as contractors would like, which is causing considerable delay in the building trade.

* * *

Operations are to commence at once with regard to the construction of the C.P.R. station in Saskatoon. The material to be used is stone and the building, when completed, will undoubtedly surpass anything in the west, outside of Winnipeg. The interior will include two large furnished waiting rooms with

lavatories and all other accommodations in connection with an up-to-date station.

* * *

The Provincial Government is building a traffic bridge in the centre of the city at a cost of $110,000, which will connect Saskatoon with her southern sister, Nutana. The concrete foundation for this bridge was completed last fall, and the steel work, which is being unloaded at the C.N.R. yards, will be erected with all possible speed.

* * *

R. H. Shore will erect a three-storey hotel, to cost about $30,000. This building will be fitted with the most modern sanitary appliances.

* * *

T. Victor is erecting a double dwelling house which will cost in the vicinity of $9,000. This will be a substantial residence, 36 x 40 feet.

* * *

The National Trust Co. will erect a block of offices on Second Avenue, costing $35,000. The contract for plumbing and heating of this block has been sublet to M. Isbister & Son.

* * *

A new up-to-date plumbing business will be opened in the near future by Russell & Barrett on Twenty-first St.

NEW WATERWORKS SYSTEMS.

A waterworks and sewerage system will be installed in Summerside, P.E.I.

The waterworks system, Chilliwack, B.C., will be considerably improved.

Work has been commenced on the extension waterworks and drainage plant at Moosamin, Sask.

The ratepayers of Indian Head, Sask., will vote on a by-law to raise $50,000 new debentures, $30,000 of which will be expended on a waterworks and sewerage system.

The Pacific Coast Pipe Co., Vancouver, B.C., have received an order to install a gravity water supply for Okanagan Centre. The water will be taken from lakes high up on the east side of Long Lake and piped across the valley.

HAMILTON PLUMBERS' STRIKE SETTLED.

The plumbers' strike at Hamilton has been settled and the men have returned to work. Under the new agreement, which will run for two years, the journeymen will receive a minimum wage of 37½c. an hour this and next year ; also time and a half for overtime, and double time for Sunday. They will work nine hours, with Saturday afternoons off. There is a recognition of the union, but the master plumbers will have control of the apprentices.

TORONTO STRIKE SITUATION.

The Toronto plumbers' strike has now been on for three weeks and as we go to press no settlement seems to be in sight. Since last issue several small employers have capitulated to the demands of the union, with the result that a few more union men are now at work. The general situation is little altered, however and both sides are still firm and resolute in their determination to fight out the questions at issue to the bitter end. A rather notable feature of the strike is that so few of the union men have left the city thus far. This would seem to indicate that the majority of the men are just as confident of securing ultimate victory as are the employers.

During the last few days several outside employers have visited the headquarters of the striking plumbers here and have offered to take a number of the picked men and five other union men who were considered among the best mechanics in the plumbing trade, left for the United States a few days ago.

Both employers and men are very reticent about giving any information except through the official channels of their respective organizations, and in this and other ways both sides are taking extra precautions lest any erroneous ideas should get abroad which would misrepresent or prejudice their side of the controversy. So far as can be ascertained the strike situation at present is:

Men on strike, including new members	500
At work	140
Out of the city	20
Small employers paying scale	40

It is very noticeable that so far there is no talk of compromise. Both sides are well prepared to stand a more or less protracted struggle and evidently the strike must go on for some little time yet.

PLUMBING AND HEATING MARKETS

TORONTO PLUMBING MARKETS.

Toronto , June 4th, 1907.—No outstanding feature claims attention in the local plumbing market this week. A good general demand exists for brass work of all kinds and one large firm has found it exceedingly difficult to keep up with its orders for compression work. The local plumbers' strike is still on and at the time of writing the line between the employers and the union appears to be drawn as tight as ever. Taking into account the very unsettled state of the labor market for the last three weeks, it is a remarkable fact that trade throughout the plumbing business is in such a satisfactory condition. While no one but the most bigoted would contend that the strike has not exercised a general deterrent influence on business yet up to the present time it has not proved to be such a drawback as one would naturally expect.

Iron pipe is still very scarce, particularly in the smaller sizes up to and including two-inch. The price remains very firm, with delivery from the mills slow and most uncertain.

The soil pipe market at the present time is practically stationary, with no alterations in the price quotations.

The discount quoted for compression work remains at fifty-seven and a half per cent.; fuller work is quoted generally at sixty-five, with one firm, however, quoting as low as seventy ; the prevailing discount for ground work is fifty- five, with one firm quoting sixty per cent.

Lead pipe and solder are in fair demand, with prices unchanged in either commodity.

A good business is being done in cast iron pipe fittings ; the price is firm and unchanged at fifty-seven and a half per cent.

The market in enamelware is rather unsteady. All the large firms were supposed to have adopted the January price list a fortnight ago, but while all looks smooth on the surface, some quiet underhand cutting is still going on ; although no one house will admit being the guilty party, jobbers continue to watch each other with feelings of mutual suspicion.

MONTREAL PLUMBING MARKETS.

Montreal, June 4th, 1907.—The feature of the plumbing markets at present is the great activity in evidence in every line. One supply house stated that it never before had experienced as heavy demand as they have during the past fortnight. So rapidly has the demand increased that the manufacturers find themselves unable in a number of cases to meet it.

There is a marked scarcity in certain sizes of iron pipe, due partly to the difficulty experienced by manufacturers in securing raw material from Pennsylvania, but due especially to the extraordinary increase of business. No advances have been made in the prices, which remain firm, despite the imminence of advances ten days ago.

The demand for soil pipe and fittings continues fair, with prospects of much strengthening during the next few weeks. The prices in these are low, and for that reason the trade is in rather an unsatisfactory condition, owing to price-cutting and to the inability of the various dealers to come to any harmonious arrangement. Prices continue unchanged.

As a consequence of the almost complete destruction of the Amherst Foundry Co's plant by fire, enamelled ware is scarce, the demand far exceeding the supply. There are no changes in prices.

A fair demand obtains for lead pipe.

Trade in brass goods, galvanized pipe, and fuller work is good, the demand continuing strong with firm and unchanged prices.

All plumbing supply houses and manufacturers in order to satisfactorily meet the demands of the trade, have to exercise a good deal of providence, as the demand this year is subject to such unlooked-for fluctuations. One manufacturer stated that he had to make provisions for increasing demand at least two months beforehand, even though it was costly business. The magnitude of building operations in Montreal is almost without a parallel, and a great impetus has been given to the plumbing trade, as well as every other line.

NEW GAS BURNER.

A burner arranged to prevent the undesirable backflash, especially when lighting the burner, and to insure a proper mixture of the gas and air, and hence the production of a powerful flame, has been patented by P. Mischke, East Rutherford, N.J.

Jardine Hand Drills

New Designs

Get samples of these machines for your show room. They will interest your customers and prove a good investment.

It pays to sell the best Tools.

A. B. JARDINE & CO.
HESPELER - - - ONTARIO

This is the Mark that Means Something

It is the distinctive brand of genuine Armstrong Stocks and Die and Pipe Fitters' Tools.
No "Armstrong pattern" or "just as good as Armstrong" have this stamp. Don't buy anything in this line that hasn't this brand as it is the mark of genuineness.

THE ARMSTRONG MANUFACTURING CO.,
292 Knowton Street, Bridgeport, Conn.

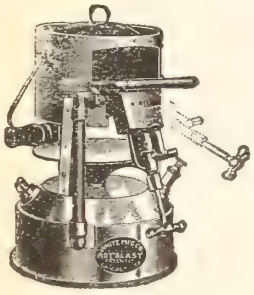
We take special care to secure the production of high-grade goods alone. That's why

"Diamond" brand Fittings

stand in a class by themselves as far as Quality and Finish are concerned.

WHOLESALE ONLY

OSHAWA STEAM & GAS FITTINGS CO., LIMITED
OSHAWA, CANADA

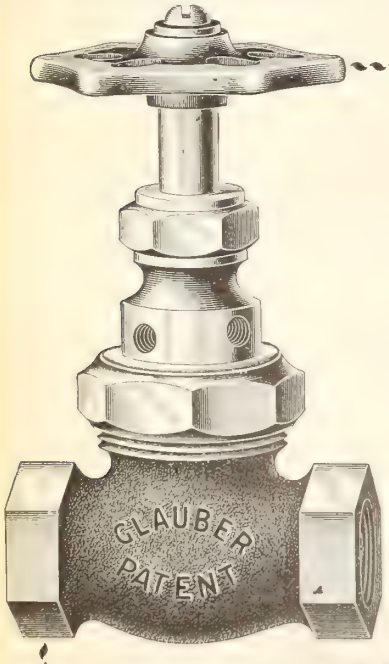


HOTTEST ON EARTH

Our Bonanza Furnaces are known to produce more heat with less fuel than any other make. Jobbers sell at factory prices. Satisfaction guaranteed or money refunded.

No. 38—Price, each, ***$7.80*** net
No. 39—One size smaller, ***$5.85*** net

THE TURNER BRASS WORKS
53 MICHIGAN STREET, - CHICAGO, U.S.A.



Automatic

SELF DRAINING COMPRESSION

STOP AND WASTE COCK

The Only Self Draining Cock Made

Patent Features, Two holes in bonnet—Upper hole for air—Lower hole for waste—insures perfect circulation and automatic drain, no matter in what position cock is installed.

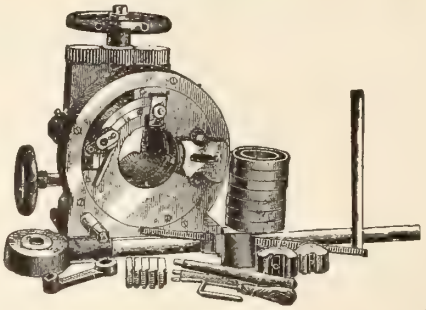
Interchangeable right or left. Quick operating stem. Made to stand Boiling Water as well as Cold.

GLAUBER FIVE YEAR GUARANTEE PROTECTS YOU

A Trial Dozen Will Make You Order More

CLEVELAND, GLAUBER BRASS MFG. CO. OHIO

A Certain Sense of Satisfaction



goes with every MERRELL PORTABLE HAND MACHINE, PIPE THREADING and CUTTING MACHINE. We build them that way.

For doing ALL kinds of threading—under ALL conditions—labor trouble and faulty material included—where speed, durability and ease of control count for something, our word to you is to investigate the MERRELL.

Whether it be stationary or portable—hand or power driven—30 DAYS FREE TRIAL must prove conclusively that your choice should be the MERRELL.

This Portable Hand Machine has encased gears, MERRELL standard quick opening and closing die-head, and the latest improved Cutting-off Knife.

Let us tell you more about this machine—The Chasers, Vise and the large range of work covered.

Catalogue for the asking.
Quick shipments.

THE CANADIAN FAIRBANKS CO.
Sole Agents for Canada Limited
MONTREAL, TORONTO, WINNIPEG, VANCOUVER

If you can use High-grade Low Down Compression Basin Cocks with China Index Handles, ask for the Acme Brass Works Nos. 4, 5, 6 and 7 Basin Cocks, which are just what you want. They are the acme of perfection in style, workmanship and durability.

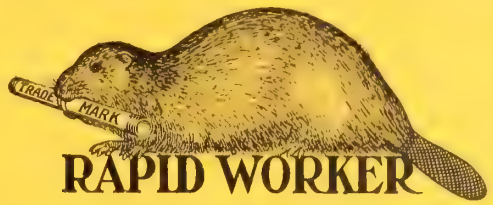
Write us to-day.
Do not delay for to-morrow.

Acme Brass Works
CLEVELAND, O.

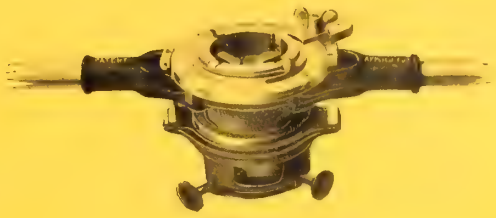
Let Our Beaver
Do Your Work.

You Don't Have to
Change Dies.

Cuts 1, 1¼, 1½ and 2″
perfect threads, all
with one set of chasers



RAPID WORKER



The Hand Stock that
Starts Easy and
Finishes Easier.

"The New Way."

You Will Find it a
Sure-enough Beaver.

Write for our special 10-day trial offer

You cannot afford to take the time to thread pipe by hand in any other way

Other sizes of Beavers will be born soon—¼ to ¾—2½ to 4—4½ to 8—8 to 12.

Manufactured by

Borden-Canadian Company

166 Adelaide Street West, Toronto

WE do not claim to make the only good boiler on the market; but — and this is important—most practical men declare that the **Sovereign Boiler** is representative of all that is best about modern heating systems.

THE

"SOVEREIGN" BOILER

is Sovereign in Quality as well as in name — it is, **the only water post Boiler built with the first section over the Boiler 50% larger than any of the others.** The **Sovereign** has a separate clean-out door for each flue section and is marketed on its merits—not because it is cheap.

TAYLOR - FORBES COMPANY, Limited

Head Office and Works: GUELPH, ONT.

TORONTO—1088 King St. West. **MONTREAL—122 Craig St. West.**

Dealers in Plumbing Equipment Have a Practical Guarantee

of larger profits and greater satisfaction in handling

Standard Ideal Cast Iron Porcelain Enameled Ware

Made in Canada from designs calculated to meet every requirement of the Trade. It is a ware that embodies in itself the durability of iron, combined with the rich white finish derived from perfect porcelain enameling.

Standard Ideal Porcelain Enameled Ware

is of non-porous, one-piece construction, leaving no joins, turns or crevices for dirt, dust or germs to accumulate. It is absolutely sanitary.

We make Bath Tubs, Sitz Baths, Shower Baths, Lavatories, Urinal Ranges, Slop Hoppers, Laundry Tubs, Sinks, Closet Ranges, Steamship Supplies, Railway Car Supplies, Hospital Appliances, Etc.

PORCELAIN ENAMELED LAVATORY CAST IN ONE PIECE.

Write for Catalogue.

The Standard Ideal Company LIMITED

Head Offices and Factories: PORT HOPE, ONT.

SALES OFFICES AND SAMPLE ROOMS:

TORONTO 50 Colborne Street

MONTREAL 128 West Craig Street

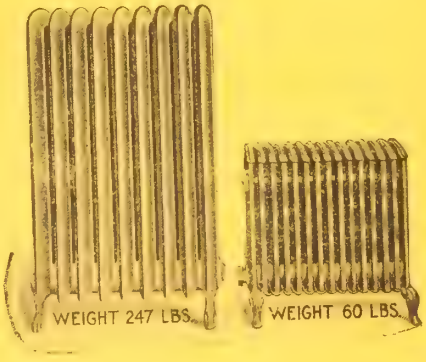
WINNIPEG 24 Telfer Block

Mr. Steamfitter!

Here are Two Pictures. Just Look at the Difference.

If you want to please your customer give him

Kinnear Pressed Steel Radiators



He will like their appearance. Save half the space that cast ones will take up, heat his house in less than half the time. You will save money in freight and men's time handling, and get a reputation of being right up to date. Kinnear Radiators occupy half the space of cast ones, hold 38 per cent. less water, heat in one third the time and heat same amount of space for same number of feet of radiation.

For Further Particulars Write

A. WELCH & SON, 302 Queen West, Toronto

Agents for Ontario

PLUMBER & STEAMFITTER OF CANADA

SUBSCRIPTION : ONE DOLLAR PER YEAR. PUBLICATION OFFICE : 10 FRONT STREET EAST, TORONTO

Vol. I. No. 6. (New Series). MONTREAL, TORONTO, WINNIPEG, JUNE 19, 1907. Old Series, Vol. XIX. No. 16

THE DAISY STANDS ON ITS MERITS

We claim a great many things for the DAISY HOT WATER BOILER—that it is the oldest heater manufactured in Canada — that it is giving universal satisfaction — that there are more of them in use to-day than all other makes combined —but what we assert the strongest is that genuine merit has been the secret of the DAISY'S unprecedented popularity.

A FEW OF THE FINE POINTS.

Quality of metal, practical design and high grade of workmanship.

Horizontal circulation.

The perfect grate, combining strength with easy shaking and dumping the ashes.

Write for Catalogue.

Our stock of Steamfitters' and Plumbers' Supplies covers the largest range in Canada. We make every effort to ship orders sent by mail the day they are received.

CLUFF BROTHERS

LOMBARD STREET, TORONTO

SELLING AGENTS FOR WARDEN KING & SONS, Limited

ROBERTSON'S MARBLE LAVATORIES

In addition to the goods illustrated, we manufacture and carry in stock a full line of staples, such as Brass Compression, Fuller and Ground Work, Soil Pipe and Fittings, Iron Pipe and Fittings, Engineers', Gasfitters', Steamfitters' and Mill Supplies. A Catalogue for each of these departments will be cheerfully forwarded on application.

The James Robertson Company, Limited

265 King Street West, TORONTO

Low Tank Combinations

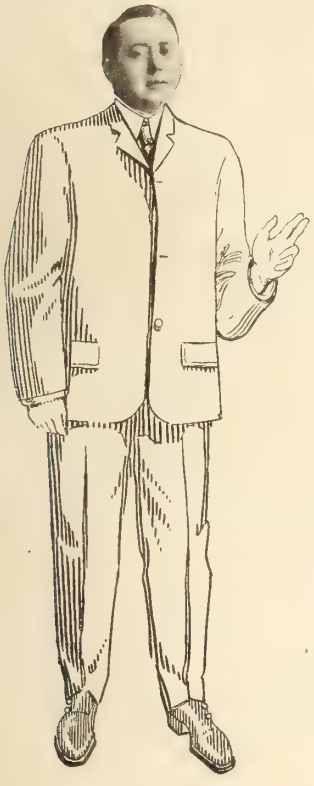
ALL STYLES

BEST ON THE MARKET

PROMPT DELIVERY

SOMERVILLE LIMITED

59 RICHMOND STREET EAST - TORONTO



Why You Should Sell the DAISY

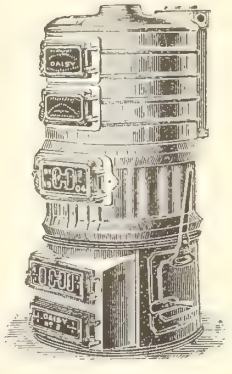
¶ *Because they are boilers of genuine merit, which fact a quarter century of constant use satisfactorily proves.*

¶ *Because no Hot Water Boiler is so well and favorably known as the Daisy.*

¶ *Because every Daisy is backed by the manufacturer's guarantee.*

¶ *Because every Daisy installed means a satisfied customer: and every satisfied customer is a permanent advertisement.*

¶ *Because the firm that makes the Daisy backs the Trade at every point.*



Write for Catalogue.

CLUFF BROTHERS

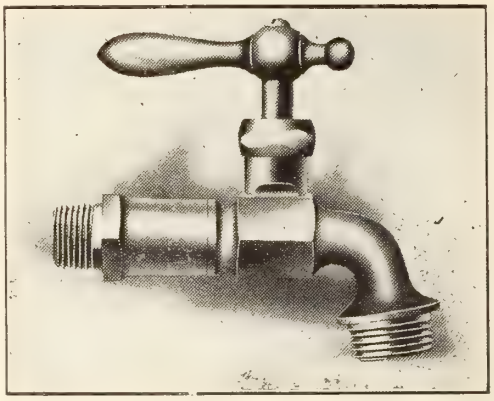
Lombard Street, TORONTO

Selling Agents for WARDEN KING & SON, Limited

Monarch is "King."

The

REASON WHY



the **"Monarch" Brass goods** have become **so popular** with the **Plumber** is **because** they are **built to a design** and **they are designed to wear.**

Use the "Monarch fully tested" goods and you're sure to have pleased customers—

Monarch Brass Manufacturing Co., Limited

Factory: Port Colborne, - Ont.

Office and Warehouse: 278 Dundas St., - Toronto

OUR ADVERTISING IS YOUR SALESMAN

Our extensive national advertising has made **"Standard"** Porcelain Enameled Ware the favorite with the House-owners in every part of the country. **"Standard"** Fixtures are easiest to specify for Kitchen, Laundry, Bathroom or Pantry because the House-owner is already prejudiced in their favor.

"Standard" Plate P1360---Porcelain Enameled Slop Sink with Nickel-plated Improved Flushing Rim, on Trap Standard Clean-out and 2-inch Nickel-plated Vent Connection to Wall, Nickel-plated Strainer, Compression Supply and Flush Fittings complete with Supply Pipes to Floor, Nickel plated Unions. Tees, Pipe Straps, Air Chambers and Spun Cup---enameled inside or all over.

Standard Sanitary Mfg. Co.

PITTSBURGH, Pa., U.S.A.

NOTICE

To the Trade:

The time has arrived when it is necessary for us to call attention to the fact that our Plumbing Specialties are being copied and imitated by other manufacturers in Canada.

Some manufacturers do not confine themselves to goods of their own invention, but absolutely steal ideas originated by others, which have cost a great deal of time and energy to produce; and since it is true that some have copied goods of our make and are endeavoring to market them,---we refer particularly to our Traps, Vent Caps, Ball Cocks, Fittings, etc., etc.,--we take this opportunity to notify the trade in general that we will immediately take steps to protect our interests. While we dislike to bring our customers, in fact any of the trade, into the controversy, we may be compelled to do so in order to prove sales and get the proper protection we should have under the patent laws of Canada.

The misson of this letter is to notify the trade of our intention in regard to protecting our interests.

The Ideal Manufacturing Company

Windsor, Canada **Detroit, Mich.**

A Plumber's Job in San Francisco

Interesting Description as to the Housing of the Refugees one year ago. Excellent sample of Permanent Plumbing Work in the Home for the Aged.

G. A. B. Spencer, in Domestic Engineering, Chicago.

The facts of the great disaster in San Francisco a year ago are no longer news but history, and so rapidly have events hurried onward since that it seems impossible that but a year has has never been told, nor can it be. presented seems to me a twice-told tale, though everyone who lived through that fearful ordeal will testify that the half have never been told, nor can it be. No pen or tongue can ever portray the horrors of that catastrophe, or overestimate its consequences. No time has been wasted in idle contemplation. Hands that were busy before have been busier since.

Temporary Living.

The genial climate made life in tents temporarily comfortable, and there were months of wholesale picnicking, but the business of a great city could not go on in such fashion.

The homeless people were encamped everywhere that tents could be pitched or shacks set up. The feeding of the multitude was a modern miracle; their transition from tents to cottages was another.

The munificent gifts from sympathetic friends, making up the great Relief Fund, and the organized efforts of the Red Cross Society in distributing it are also matters of history that may not be overlooked in any allusion to the disaster. One point that has never been widely exploited was the tremendous and immediate demand for mechanical work and the over-taxation of every facility to meet the emergencies arising.

Since the work of "rehabilitation" has loomed so large in San Francisco there have been many attempts to write it up from many different points of view, but I take it that nobody else ever sees all that the plumber sees, and no one so far has written from the plumber's standpoint.

Instant Relief Received.

When twenty-five hundred acres of a populous city was at once reduced to chaos, the source of supply for all the Pacific States was destroyed and there was absolutely nothing to work with, of either material or tools, to be had on the Pacific Coast. The prompt action of the organization of master plumbers in other Pacific Coast cities, followed by similar gifts from the east in sending by express tools and money to begin with, was a relief beyond expression, demonstrating the practical and fraternal character of our "association."

Everything had to be brought from the east over railroads congested with other urgent supplies. Water and gas mains and sewers were broken, and all water and gas pipes, electric wires and street railways out of commission. These were the conditions. Business firms hurried into temporary buildings with

In this "camp" at Lake Street and Thirteenth Avenue are 1,600 houses providing cheap temporary homes for 4,000 people who were rendered homeless by the earthquake and fire. The plumber had to do the plumbing and lighting and furnish water supply and a sewer system, and it was all done in seven months.

amazing celerity, and their necessities were beyond the power of the forces to be employed. But the consideration of homes for refugees had to be undertaken, and nothing less than a centralized authority, with unlimited means, was adequate to deal with it.

Providing Cheap Homes.

In the course of the summer the victims of the earthquake and fire most able to do for themselves became self-dependent, but many thousands remained who could have no hope of being able to pay rents in the city, for whom cheap homes must be provided. To meet this necessity the board of directors of the San Francisco Relief and Red Cross Funds organized a land and building department, of which Thomas Magee was chairman.

The Spencer Plumbing Company, then Spencer & Fisher, was one of the first houses in our line to open for business after the fire. A valuable experience was acquired in those first few months and many lessons learned in expediting affairs. By the time the land and building department was ready to undertake the big job of housing the refugees we were ready to catch on with the plumber's part of it.

The value of land made it necessary to erect temporary buildings on public squares, parks and other city property, and a systematic plan of work was arranged.

I was asked to look over the public squares and parks to consider the feasibility of their proper sanitation and facilities of connection with city sewers. The notes made in doing so afforded the data for the plans, which I very soon had ready, and which were adopted by the department.

Laying Out the Work.

Then the squares and parks had to be regularly laid out for as many rows of small cottages as each could properly accommodate, the cottages being of one design—having two or three rooms—and at regular intervals groups of closets; each square having a large social hall, a double cottage to be used for a business office and dispensary, and in the larger squares public laundries and bath houses.

For these extensive plans of building the plumber's work had to move in quick step.

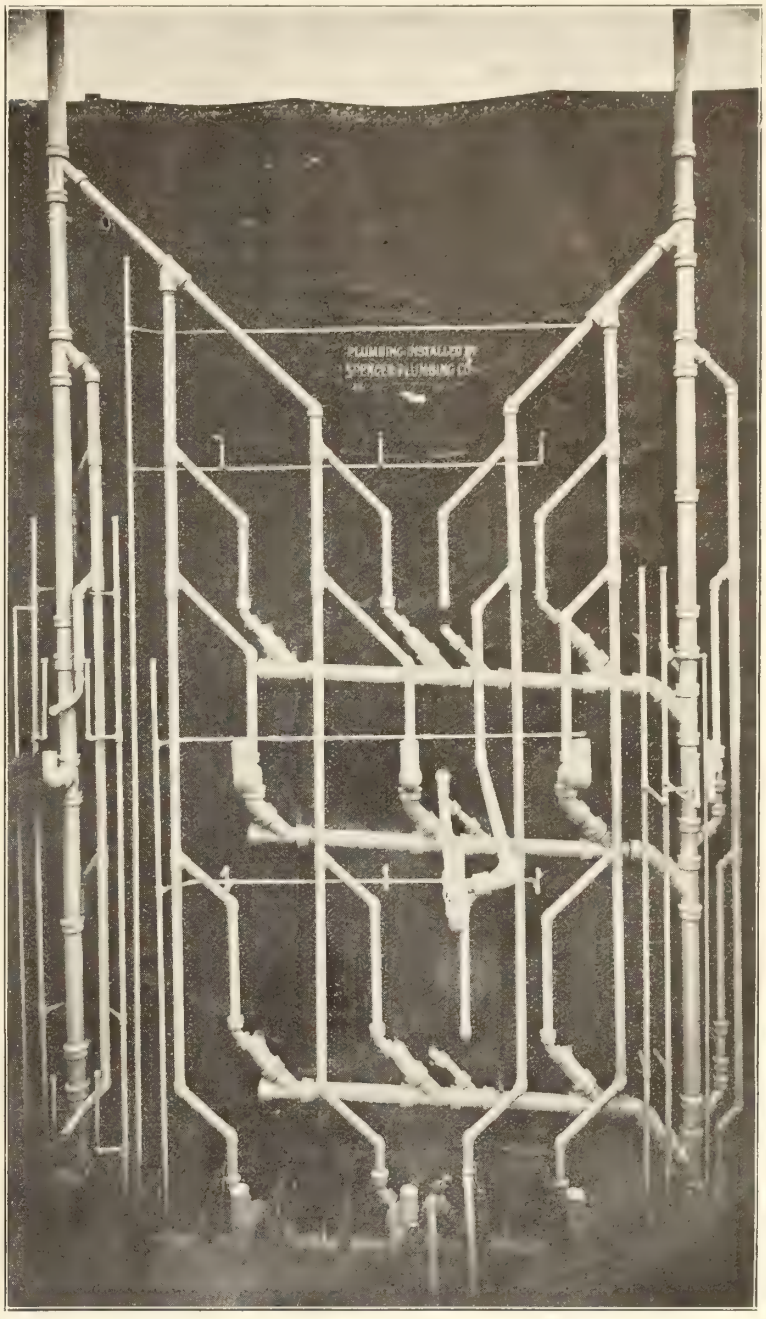
Getting Necessary Lumber.

Difficulties rose up as if the earth and all within it, and upon it, were still quaking. To begin with, the lumber trust had raised the price of lumber to rates that would seem to demand all the money in sight. Mr. Mackie, the general manager of the department, actually "took to the woods," not because he was scared, but to get behinds the trusts, and there secured 3,000,000 feet of lumber, and shingles galore. Steamers were chartered to bring it to the city, and unable to get teams to haul it, men and teams had to be brought from another county, mills to be set up on the ground, and various other obstacles to be overcome.

Securing Necessary Labor.

The carpenters' unions would give a card to any man who could drive a nail, so their work rushed; but the plumbers' unions, more jealous of their craft, would give cards only to competent men and accepted only as such, men who presented cards from affiliated unions, and though the highest wages were paid, it was impossible without unceasing manoeuvering and moving of men from one point to another, to keep the plumbers' work up to the carpenters, though seventy journeymen plumbers were employed.

There were not available plumbers enough in the city. Advertising for forty men often brought us but three or four. We advertised in the papers and put up painted canvas notices 15x3 feet at prominent places, calling for plumbers. On two occasions an emergency was met by accepting all the men we could get for a Sunday who were working for other firms and paying them double wages for the day, as the only way to keep up with the carpenters and have the cottages ready for use before the winter rains should set in.



Roughing in for twenty-three lavatories in the Home for the Aged and Infirm in San Francisco. Though the buildings are but two stories high, the differing levels of the floors, due to the elevation of the site, calls for four floor levels in the space of two. There are ten more fixtures in this group which are not visible in this photograph.

Beginning of the Work.

Our work on these temporary buildings began at South Park, a beautiful

(Continued on Page Ten.)

PLUMBER AND STEAMFITTER
OF CANADA

The MacLean Publishing Co.
Limited

JOHN BAYNE MacLEAN - - - President
W. L. EDMONDS - - - - Vice-President
H. T. HUNTER - - - Business Manager
WESTON WRIGLEY - - - Managing Editor

Publishers of Trade Newspapers which circulate in the Provinces of British Columbia Alberta, Saskatchewan, Manitoba, Ontario, Quebec Nova Scotia New Brunswick, P. E. Island and Newfoundland

OFFICES:
MONTREAL - - - - - - 232 McGill Street
Telephone Main 1525
TORONTO - - - - - - 10 Front Street East
Telephones Main 2701 and 2702
WINNIPEG - - - - 511 Union Bank Building
Telephone 3726
LONDON, ENG. - - - - 88 Fleet Street, E.C.,
J. Meredith McKim
Telephone, Central 12960

BRANCHES:
CHICAGO, ILL. - - - - - 1001 Teutonic Bldg.
J. Roland Kay
PARIS, FRANCE - Agence Havas, 8 Place de la Bourse
MANCHESTER, ENG. - - 92 Market Street
ZURICH, SWITZERLAND - - - Louis Wolf
Orell Fussli & Co.

Subscription, Canada and United States, $1 00
Published Twice Every Month
Cable Address { Adscript, London / Adscript, Canada

TRADE CONVENTIONS.

The National Association of Master Steam and Hot Water Fitters held their annual convention at Washington, D.C. May 21 and 22. Over 100 delegates and representatives of supply houses were present.

About 1,000 delegates and friends are expected to visit Louisville on June 26, 27 and 28 to attend the "Silver Anniversary" of the National Master Plumbers' Association, the greatest trade organization in the world.

The annual convention of the National Plumbers and Steamfitters' Association of Canada, which is to be held in Montreal early in August should be attended by everyone in the trade who desires to see existing conditions improved. Secretary Gordon is preparing a fine programme and the event should be both enjoyable and instructive.

OUR MARKET QUOTATIONS.

Attention is drawn to the market quotations published on page 17 of this issue. When the first issue of The Plumber and Steamfitter was announced word was received from some prominent master plumbers that the publication of market quotations had been criticized at conventions of the National and Provincial Master Plumbers' Association. Price quotations have, therefore, been eliminated in market reports in previous issues.

Objection has been taken by several readers, however, and some refusals to subscribe have been made owing to the absence of the quotations. Solicitors for subscriptions have explained that plumbing shops are usually wide open places of business and it is hard to keep customers from picking up trade literature containing trade price lists.

It seems hard to please every reader, but the editor is endeavoring to find a happy medium between the conflicting forces. Readers are asked to write the editor expressing their ideas regarding the market reports from Montreal and Toronto published in this issue. Are the figures as given in the Toronto report objectionable to any readers ?

PROMPT METHOD OF COLLECTION

A very novel and catchy method of collecting amounts due for jobbing work has been employed with good success by an enterprising American plumber. He does not defer sending in the account till the first day of the month rolls around. The very day the work is completed, the plumber in question charges it in his day book and mails the customer an itemized statement of the charge with the following printed form appended :

> Notice.—This bill is mailed upon completion of work for your inspection. In case of any error as to labor or material, you will confer us a favor by reporting same at once. Two per cent. discount will be allowed if paid within 10 days from date.

"It works like a charm," said the enthusiastic plumber in commenting upon the success of his experiment, "and you should see how the bargain-hunting women are appealed to by that two per cent. in ten days."

At first several of his customers tried to take exception to this new method of collection. Some derisively asked him if he was afraid to trust them till the first; others interrogated him as to whether it was good policy to allow the job to grow cold before presenting the bill. But the plumber simply politely pointed to the printed notice and replied that they could certainly have until the first of the month, if they so desired. At the same time he explained that his object in promptly mailing the bill upon the completion of the work was that any mistake might be rectified, if it existed, while the matter was fresh in mind. Every day is the first of the month with him now, for he has successfully educated his customers to see that by a prompt payment a mutual advantage results; when, however, payment is not forthcoming as a result of the first notice, the regular monthly statement follows on the first of next month and invariably proves to be a more effective reminder because preceded by the other.

In view of the fact that this American plumber has adopted this method with such success, would it not be wise for some of his Canadian confreres to inaugurate this or a similar system and ascertain with what degree of success it operates ?

WESTERN RAILWAY DEVELOPMENT.

The summer of 1907 promises to see the greatest activity in railway construction that Western Canada has ever known and the expenditure of the vast sums of money required to carry on the projected extensions will undoubtedly assure a prosperous year for the west and employment for all the labor that can be attracted to the country.

Work is being pushed ahead rapidly on the Grand Trunk Pacific lines, the Canadian Northern and Canadian Pacific have large extensions projected and under contract and the coming summer will see active work on Jas. J. Hill's line from Winnipeg to the coast. In all some 5,800 miles of road are under contract for the various companies, made up as follows: Canadian Northern, 1,500 miles ; Canadian Pacific, 1,400 miles ; Great Northern, 1,000 miles and Grand Trunk Pacific, 1,900 miles. In addition, taught by the sad experience of the past winter, the railways are spending large sums for additional equipment of the lines already in operation.

Many New Towns.

This means much for the immediate development and prosperity of the west. In the older countries and in the older settled parts of Canada railways are built in order to connect towns already in existence, but in the west the railways when built open up new territory and are responsible for the existence of many new towns. It is true that the Great Northern lines in Canada will run through the settled portions of the west ; the Great Northern is not a pioneer road and it is receiving no Government assistance. But while this is true of the Great Northern it is not the case with the Grand Trunk Pacific of the projected extensions of the Canadian Pacific and Canadian Northern. These lines will open up new territory and any person familiar with the new main line of the Canadian Northern between Winnipeg and Edmonton knows what that means. On that line there are now many prosperous little towns that had no existence eighteen months ago. The road made accessible a rich agricultural country and settlers took up land along the line. The new towns were a necessary result. More than one hundred new towns will be founded during 1907 along the line of the Grand

Trunk Pacific between Winnipeg and Edmonton. This announcement has been made by the officials of the new transcontinental. It has been the policy of the C.P.R. to keep the towns about twelve miles apart but the G.T.P. management propose establishing stations and townsites at more than 100 points on the 790 miles of track between Winnipeg and Edmonton. This means a new town every seven miles.

West's Great Need.

The great need of the Canadian West is adequate transportation facilities. Given a big extension of the railway systems and adequate equipment for every mile of track in operation nothing can stop the speedy development of the country and the exploiting of its varied resources. Immigrants are pouring in this spring at the rate of more than 1,000 per day and the big problem is to get them to their destinations quickly and safely. The western market will absorb vast quantities of merchandise but the problem this winter and spring has been to effect deliveries of goods ordered. For that reason the great railway development promised for this year is welcomed by every business man interested in the west. The experience of the winter has taught him that the railways must improve their equipment if they are to provide satisfactory service and boards of trade are demanding that before the Governments advance any further assistance to the railways for the construction of new mileage, whether by way of subsidy or guarantee of bonds, they must insist upon the purchase of more motive power and rolling stock for the mileage already in operation.

The railway magnates are among the shrewdest business men in Canada. The fact that they are making such large expenditures for the construction of additional mileage is conclusive evidence of their unbounded confidence in the future of the country.

DEFINITION OF MASTER PLUMBER

A correspondent draws attention to the desirability of amending the definition of a "Master Plumber," referring to the large number of bosses who are licensed as masters, but have no place of business other than their residence. "There is no objection," he says, "to a plumber working as a plumber, but there are decided objections to plumbers getting the prices and terms of a business man without bearing the recognized costs of business."

The point is well worthy of discussion, but, like every question, there are two sides for consideration. The columns of The Plumber and Steamfitter are open for correspondence on the subject.

Organization of the trade is undoubtedly the remedy. The correspondent agrees with this conclusion, and adds: "The locals should reorganize and at once take steps that will allow their members to pay their way as business men and thereby assist, to an extent equal to other business men, in the growth of their cities. Your paper has started right in that direction. Keep it up."

ELECTRICITY IN THE HOME.

In a $3,000 or $4,000 house, it is a very common matter to wire for electric lights; but by giving the subject a little further attention with your electrical contractor and the architect, it is possible to arrange for socket heating devices at very little extra expense. Such receptacles would be taken off from the lighting wires in a very simple manner. The cost of operating later at lighting rates, would not be large, for the reason that the electric devices which will be used on such a circuit consume only a small amount of electricity and are generally used for only short intervals.

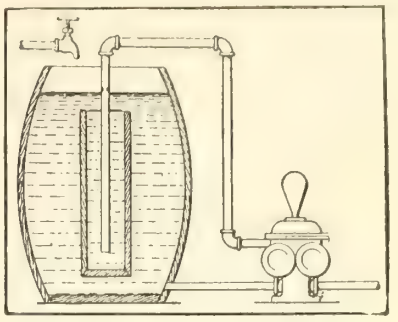
SOMETHING USEFUL WANTED.

An advertisement in a recent issue of the Evening News, London, Eng., carries its message so clearly that comment would be superfluous.

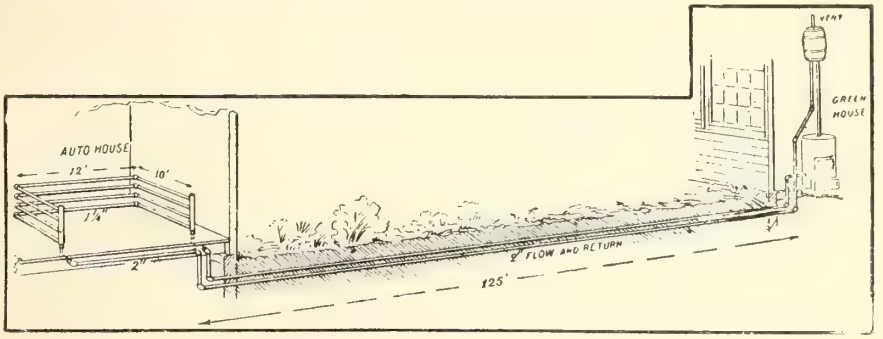
"Bath for Sale, 10 shillings, or exchange for anything useful."

LONG MAIN HEATING SYSTEM.

As there are many failures in long-distance heating systems the following successful arrangement may be of value to some readers. In this case the heater is 125 feet from the radiating coil. The success of the system depends largely on the elevated receptacle. In this case the flow main was carried up from the heater to a barrel. Any other receptacle would serve the same purpose, says a correspondent of the Metal Worker, provided it was located twice the height above the boiler as the drop of the main is below the boiler. The piping must be direct from the boiler to the barrel, then from the barrel to the specially made header coil. This heating system has been working with perfect satisfaction for the past two winters. The header coil is likely to be the cause of trouble if it is not made to form at least one angle, so that the unequal expansion of the hotter pipes at the top and the colder [illegible] of the bottom may be compensated for in the spring of the piping.



Method of Muffling the Exhaust.



Successful Long Main Hot Water Heating System.

EXHAUST MUFFLER AND HEATER

A correspondent in the Engineers' Review shows how the feed water was heated in a small plant. The exhaust from the pump was brought into a barrel, as shown, and in order to avoid the cracking noise, which usually takes place when steam is condensed in cold water, a wooden box was built around the pipe. This box is about 8 inches square, and the top is kept below the surface of the water in the barrel about one inch. In a few minutes the water in this pipe becomes hot and then all noise ceases. The hot water overflows and cold water enters over the top, thus making a noiseless heater. A small 1-16-in. hole is drilled in the exhaust pipe close to the water in the barrel to avoid a vacuum in the pipe when the pump is stopped.

ELECTRIC HEATER.

An electric heater for metal workers has been invented by J. O. Luthy, Austin, Texas. The heater is of novel construction and parts of certain re-agents forming a bath for utilizing the electric current through the bath to raise to a red heat any piece of metal plunged into this bath. By it workers are enabled to quickly and conveniently heat metal to a welding temperature without the use of a forge or a fire.

Cost of Heating Storehouses

Paper read by H. O. Lacount, Boston, Mass., before the American Society of Mechanical Engineers last month

In the work of the Associated Factory Mutual Fire Insurance companies the problem of protecting storehouses and their valuable contents against fire has required careful study. In nearly all classes of manufacturing properties experience has conclusively demonstrated that the automatic sprinkler, supplied with ample water, is the best means of protection. As is generally known, the automatic sprinkler has an orifice about

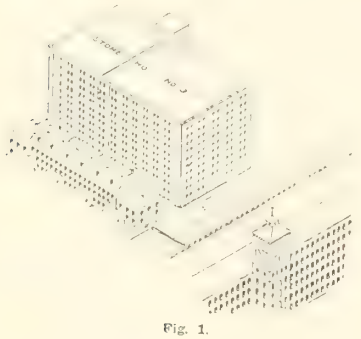


Fig. 1.

½-inch in diameter, which under normal conditions is closed by a valve held in place by links or struts, so arranged that on the melting of some fusible solder the valve is liberated and water immediately discharged. For the average case a temperature of 160 degrees F. is sufficient to open a sprinkler, and the great work which the automatic sprinkler has done in reducing fire losses comes from the fact that it stands ready night and day instantly to deluge a fire with water at its start. The records show that the majority of fires are held in check, or even extinguished, by the opening of less than a half-dozen sprinklers.

The larger part of the storehouses are not heated, so that in winter water in the sprinkler pipes would freeze. This led to the development of several types of automatic valves which would permit draining water from the sprinkler system during cold weather and filling the pipes with air under pressure. The valve, ordinarily known as a "dry pipe valve," was so designed that on the opening of a sprinkler and the escape of the air, the valve would let in the water. They require frequent attention while in service, and there is always the chance of a system being put out of commission for some time, due to water freezing in the pipes in case they were filled and could not be promptly drained. For these reasons it has always been considered preferable to have the full water pressure constantly on the heads, and this raised the question of the possibility of economically warming storehouses just sufficiently to prevent freezing.

Difference Between Inside and Outside Temperature.

In 1901 we did not know of any heated storehouses where a test could be made of the actual amount of steam required to keep the temperature in such buildings above freezing, say, at 40 to 15 degrees F., and therefore as a preliminary step a series of tests were carries on during the winter of 1901-1902 in several storehouses in different parts of the country to determine the average difference between the outside and inside temperatures of unheated buildings when used in the ordinary way for storehouse purposes.

It was assumed that the temperature inside light wooden buildings would necessarily closely follow the outside temperature and therefore this class of building was not included in the test, but only those of brick, in which an appreciably higher inside temperature might be expected. However, buildings of different sizes were chosen, to see what influence this item of cubical contents might have on the relative inside and outside temperatures, and by selecting storehouses in different sections of the country a wide variation of weather conditions could be studied. These results showed that as a general rule: (a) The inside temperature changes gradually and does not follow the sudden temperature changes out of doors. (b) The inside temperatures were a fairly good average of the outside temperatures. With but few exceptions, they never reach either the highest or the lowest outside readings, even when the outside conditions remained reasonably constant for a number of days. It was noted that the temperature inside a brick storehouse at Baltimore, Md., kept well above the freezing point throughout the winter.

Test of Steam Heated Storehouses.

During the summer of 1902 No. 3 storehouse of the Hamilton Manufacturing Company, of Lowell, Mass., (Fig. 1), in which temperature readings had been taken the previous winter, was equipped with steam heating pipes, so that water could be kept on the sprinklers during cold weather. This offered an opportunity to determine the amount

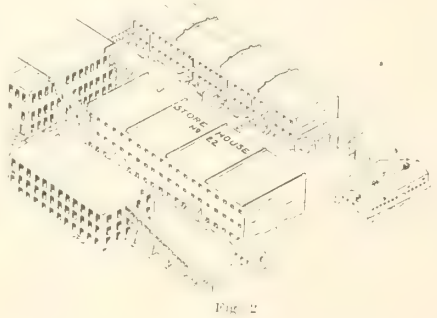


Fig. 2

of steam necessary to keep the building warm. About this time storehouse No. 22 of the Lewiston Bleachery & Dye Works, Lewiston, Maine, (Fig. 2), in which temperature readings had also been taken during the winter of 1901-1902, was piped for steam, and during the summer of 1903 the large four-section storehouse (A) of the Bates Manufacturing Company, Lewiston, Maine, (Fig. 3), was built and also piped for steam heating. At the Androscoggin Mills, Lewiston, Maine, (Fig. 4), the building known as storehouse No. 6, was heated. These buildings gave additional opportunity to obtain data on the cost of geating.

The buildings and heating systems are briefly as follows:

The storehouse in Fig. 1 was of brick, plank and timber construction, 100x192 feet, 10 storeys and basement. The building was divided into vertical sec-

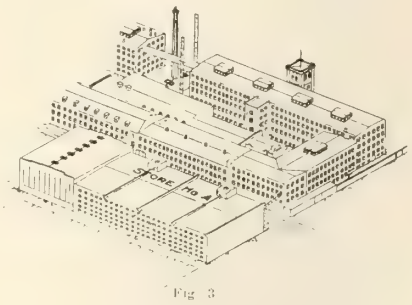


Fig. 3

tions by a blank fire wall. Access to the several floors was obtained through double tin-clad fire doors in a common elevator and stair tower, the tower being open on one side out of doors. The surrounding buildings were comparatively low, affording no wind protection to the upper stories. The building had a large number of windows of small area, made of ordinary glass in wooden frames. There were a few doors on the first floor for shipping purposes in addition to those in the tower. There were numerous cracks in the floors, due to the shrinking of the planks. The floors contained cotton in bales and cloth in bales and cases, with the exception of two floors of one section, which were vacant. The storehouse was possibly two-thirds full.

The heating system consisted of one line of 1¼-inch pipe near the ceiling, about 3 feet from the outside walls of each floor, with an additional loop in the top floor under the roof. These pipes were supplied from two risers, one in each section, the lower half of each riser being 3 in., the upper half 2 in. The pipes also connected with two drains, one for each section, the lower half of each being 2 in., the upper 1½ in. Steam could be cut off from any floor by gates at the risers, and approximately every alternate floor was kept shut off during the test, which probably could not have been done had it not been for the cracks in the floors, which allowed the heat from one storey to pass into the one above. The steam was taken from one of the main mill supply pipes and tapped at different points for various purposes. By means of a reducing valve at the point of entrance to the storehouse the pressure in the heating system was kept at 2 lb. or less, by gauge, except for a few hours one afternoon, when the pressure was increased to from 6 to 10 lbs. in anticipation of an exceptionally cold night. The drain pipes from the heating system were run to one "dump" trap, which delivered all

condensed steam into the barrels used in the test.

The storehouse, (Fig. 2), was of brick, plank and timber construction, 71x280 feet, two storeys and basement, divided into four vertical sections by fire walls having double tin clad doors at the openings. There were no openings between the basement and first floor, but from the first to second floor were two open stairways and one open chute. The storehouse was shielded from the wind to some extent by buildings on three sides. The building had several windows, but of small area, made of ordinary glass in wooden frames, and there were four or five outside doors; the basement contained chemicals and miscellaneous storage, and the first and second storeys cotton goods in bales and cases. The storehouse was about two-thirds full.

The heating system consisted of one line of 1¼-in. pipe near the ceiling, a few feet from the outside walls of each storey, with an extra loop in the top storey of one end section to take care of the extra cold due to the roof and wind exposure from that direction. The steam was taken from the mill boilers. The boiler pressure was 80 lbs.; pressure in the heating system, 12 to 15 lbs. by gauge. The heating pipes in the storehouse were drained into a trap which delivered into the barrels used in the test.

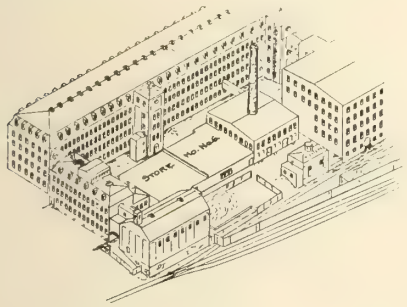


Fig. 4.

The storehouse, (Fig. 3), was of brick, plank and timber construction, 113x254 feet, four storeys and basement, divided into four vertical sections by blank fire walls, access to the different floors being obtained through tin-clad fire doors in the elevator and stair towers. The building was protected from the wind to some extent by surrounding buildings. The building contained numerous windows of small area, made of wired glass set in metal frames. With the exception of two warm opener rooms, each 22x34 feet, not included in test, the basement was vacant. The upper floors contained cotton in bales and cased goods, and were nearly full.

The heating system consisted of one line of 1¼-in. pipe near the ceiling, running entirely around each section in each floor, the pipe being located a few feet from the walls. There were two supply pipes and two drain pipes for each section, and a sufficient number of gates were provided, so that the heating pipes could be controlled in four divisions in each floor. In addition to the above, three radiators were placed in each section of the first floor along the northeast wall to prevent freezing of the water in the sprinkler pipes near the doors which were necessarily opened from time to time when making or receiving shipments.

Steam was supplied from the mill boilers, about 380 feet distant. The steam main for mill service was tapped a short distance from the storehouse for a 3-in. supply for this heating system. The boiler pressure was 65 lbs., and at

Summary of Data Regarding Heated Storehouses.

Items.	Fig. 1.	Fig. 2.	Fig. 3.	Fig. 4.
Cubical contents, cu. ft.:				
Exclud. tower not heated	1,786,000	646,464	1,275,764	119,760
Exclud. basement and tower	1,622,800	646,464	942,956	149,760
Outside surface exposed, sq. ft.	75,360	36,821	56,028	16,616
Roof, sq. ft.	19,260	15,392	28,702	11,520
Walls exposed, sq. ft.	56,160	21,432	27,326	5,096
Windows:				
Total number	565	100	92	4*
Glass area, sq. ft.	3,690	1,207	1,164	128
Per cent. glass area to wall	6.5	5.6	4.7	2.5
Glass area to cubic contents	1 to 440	1 to 396	1 to 810	1 to 117
Outside doors:				
Number of	30	8	16	2
Area, sq. ft.	900	314	350	52
Per cent. door area to wall	1.6	1.6	1.11	1.02
Ratio door area to cubic contents	1 to 1,803	1 to 1,878	1 to 2,690	1 to 288
Per cent. total door and window area to wall	8.15	7.23	5.51	3.54
Ratio total door and window area to cubic contents	1 to 351	1 to 416	1 to 623	1 to 830
Heating system:				
Total heating surface, includ. risers, sq. ft.	3,006	690	3,730	316
Per cent. in top storey	16.3	15	20.8	
Ratio heating surface in top storey to area of roof	1 to 39	1 to 44	1 to 40	1 to 36
Ratio total heating surface to cubic contents	1 to 594	1 to 936	1 to 342	1 to 473
Ratio total heating surface to area of roof and walls exposed	1 to 25	0 to 534	1 to 14	1 to 53
Per cent. of heating surface used in test	58	100	75	100
Steam:				
Pressure in system	1 to 2	12 to 15	60 and 10	15 to 17

* Double windows. Items.

Table of the Cost of Heating Storehouses.

	Fig. 1.	Fig. 2.	Fig. 3.	Fig. 4.
Temperature (degrees F.):				
Outside—				
Average	12	14	7	14
Maximum	32	21	18	24
Minimum	1	—14	— 1	— 6
Inside (exc. warm basements)—				
Average	41	47	48	49
Maximum	51	59	61	56
Minimum	32	37	43	41
Difference between average inside and outside	29	33	41	35
Average outside for coldest 24 consecutive hours during test	8	3	6½	6
Average inside for same period	40	46	47	49
Steam used:				
Total consumption, pounds	56,929	49,282	70,096	20,007
Average consumption per hour, lbs.	612	380	815	156
Average consumption per 24 hours, lbs.	14,688	9,120	19,560	3,744
Average consumption per 24 hours per 1,000 cu. ft. of contents, lbs.	8.06	14.2	14.8	25.1
Cost of heating:				
Estimated first cost of steam pipe installed, including trap and reducing valve, also gates for each floor of each section. (30 cents per square foot of heating surface)	$ 900	$210	$1,120	$95
Same per 1,000 cu. ft.	$0.555	$0,325	$1.19	$0.634
Cost of steam to heat per 24 hours (assume 8 lbs. of water evaporated per pound of coal, from and at 212 degrees F., price of coal $4.25 per 2,000 lbs.)	$3.90	$2.42	$5.20	$0.99
Cost of steam per 24 hours per 1,000 cu. ft. of st. h.	$0.0024	$0.0037	$0.0055	$0.0066
Number cubic feet of st. h. heated per pound of coal per 24 hours	884	566	385	319

Average cost of steam per 24 hours per 1,000 cu. ft. of storehouse for the above three brick buildings is $0,00386.

the entrance to the storehouse 60 during the first part of the test, but during the final test the pressure was reduced to about 10 lbs. by throttling the valve at the entrance, no reducing valve having been provided. The system was originally laid out with a trap at the bottom of each vertical drain pipe, these traps discharging into a common return drain. However, they did not operate satisfactorily and were cut out and a large trap was inserted in the common return pipe for the tests, this trap discharging into the barrels.

The storehouse, (Fig. 4), was of wood, 72x160 feet, one storey high, having plank and timber roof and floor and walls made of two thicknesses of boards, with two thicknesses of heavy building paper between them, a total thickness of 2½ in. The building was divided into two vertical sections by a fire wall containing one opening, protected by a double tin-clad fire door. The building had four large windows, protected by outside storm windows. There were also two outside doors. The building contained mostly cotton in bales, and was nearly full. The heating system consisted of one line of 1¼-in. pipe, located near the ceiling, a few feet from the outside walls, and an additional length of 1½-in. pipe through the centre of the building. Steam pressure at entrance to storehouse, 15 lbs. by gauge. The condensed steam was piped to a trap, which was discharged into the barrels used in the test.

During the tests the storehouses were used in the usual way, and the steam was turned on and shut off by the mill employes as they had been accustomed to do, so that as far as the use of the buildings was concerned the conditions during the tests were in no way special and, therefore, were representative of the average service. At the Bates' storehouse (Fig. 3) the preliminary tests showed that the buildings were being kept at an unnecessarily high temperature, and a correspondingly excessive amount of steam was being used. In the final tests at this storehouse the steam pressure was reduced, as previously mentioned, with a view to keeping the temperature, say, between 40 and 45 degrees, which practice was followed after the tests.

Results of Tests.

It was found that :

(a) The temperature inside of each storehouse was quite uniform in the upper stories, but varied somewhat in the first storey, due to the frequent opening of the outside doors for shipping.

(b) The variation in the steam consumption corresponded roughly to the changes in the outside temperature.

(c) While the temperature of the condensed steam varied considerably in some of the tests, the average temperature was about 200 degrees F.

(d) Storehouse, (Fig. 1). The effect of cracks through the floors is clearly shown, in that alternate floors could be kept sufficiently warm without steam in those floors, although the temperatures were uniformly a few degrees lower in those floors than where the steam was in the pipes.

(e) Storehouse (Fig. 3) : With the storehouse tightly closed, as during the night and on Sunday, the building cooled very slowly. Therefore it had been the practice to keep the steam shut off during these times, but of course keeping watch of the inside temperature. The tests also show that the storehouse required several hours with the steam on to regain its normal condition. With about 10-lb. steam pressure in the heating system night and day, the average temperature throughout the storehouse was substantially the same as when the steam was in the pipes during the daytime only—that is, from 6 a.m. to 6 p.m., but at 60-lb. pressure. It is also of special interest to note that under these conditions, the steam consumption per 24 hours was about 35 per cent. greater with 60-lb. steam pressure during the days than with 10-lb. continually.

Another table gives a summary of the inside and outside temperatures and the cost of heating for the period during which storehouses were under test.

Estimating the Heat Losses.

Having obtained definite information regarding the amount of heat necessary to keep these shorehouses at the desired temperature, it has been of interest to apply formulae and compare the actual with the estimated cost. The heat required for each of the four storehouses under the conditions of the tests has therefore been estimated using formula H equals k $(t_1 - t_0)$ S and constants as clearly described by Prof. J. H. Kinealy, Washington University, St. Louis, in a useful little book, entitled "Formulae and Tables for Heating." H equals British thermal units per hour, k equals constant, value being as given in "Formulae and Tables for Heating," t_1 equals average inside temperature, t_0 equals average outside temperature. S equals area of cooling surface in square feet. Applying this formula to the storehouses in question gives results shown in the table following, where are also given for purposes of comparison the figures obtained from the tests :

Storehouse	B.t.u. per hour. By formula	By test	Per cent. difference.
Hamilton, (Fig. 1)	620,000	626,000	0.97
Lewiston, (Fig. 2)	373,000	369,000	— 1.6
Bates, (Fig. 3)	682,000	800,000	17.3
Androscoggin, (Fig. 4)	151,000	148,000	— 2.0

In the case of the Hamilton and Bates storehouses the figures given by the formula were increased 10 per cent. on account of exposure, and for the Bates storehouse a further increase of 5 per cent. was made because of the unusually high wind which prevailed during a considerable part of the test. The table is of special interest as showing how accurately the required heat may be calculated, and the author finds peculiar satisfaction in this close check between the estimated and actual results, believing that the work here described will still further increase the confidence of engineers in the results obtained from using the formula and constants mentioned. In the case of the Bates storehouse it may be that the outside shipping doors were open more of the time than was noticed, so that a special allowance for this should have been made when applying the formula. If so, this would account for at least a part of the difference between the estimated and actual results.

A PLUMBER'S JOB IN FRISCO.

(Continued from page 5.)

garden spot in what had once been a fashionable residence quarter, but more recently occupied by mechanics and laborers. Nineteen apartment houses were built in this park, all sewered, with patent flush closets, water and gas in each room and hall, kitchen sinks, gas stoves, etc. The San Francisco Gas Company installed the gas pipes, fixtures and stoves in all the other parks and squares where gas is used.

The other thirteen squares and parks were used for the system of small two and three-roomed cottages, and being widely scattered, there had to be differences of plans to suit each location. The first sod was broken for these September 11, 1906. Five miles of sewers were laid to accommodate these cottages, and we feel justified in some degree of pride that the sanitation of these parks has been so successful. In these public squares we installed 667 patent flush closets, 247 hoppers and more than six miles of gas and water pipes, with all necessary fittings and incidentals; 325 galvanized sinks with faucets and traps were put into the apartment houses at South Park, and 624 gas brackets; 4,168 three-room cottages and 1,770 two-room cottages are included in this undertaking. Besides these 210 rooms and ten lofts, with kitchens for 1,000 people, have been equipped at Ingleside for refugees who are not self-supporting.

These buildings are now occupied, within a year after the conflagration which made them necessary and seven months from the day the first sod was broken for them. .

At South Point Lobos, a strip of land designed for a boulevard to connect Golden Gate Park with the Presidio, but not yet raised to the required city grades, was appropriated for this purpose, but having an elevation below the level of the sewers in that vicinity. To overcome this difficulty an automatic electric injector was installed, by which the drainage of 600 houses is pumped from a large cesspool, carried several hundred feet and discharged into the main sewer, involving a lift of twenty-five feet.

The larger parks are provided with general laundries, with abundant hot water for all, laundry trays, drying rooms, and all accessories. The heater for these is in the centre of the building, the other half being used for separate bath houses, with enamelled tubs and shower baths, for men and women.

Thirty Thousand People Provided For.

In this brief time 30,000 people have been provided with shelter in these houses.

These cottages, built on city property, are necessarily temporary, but are so constructed as to be readily removed. The small rent paid is credited to the tenant and at the end of ten months it will be his, and he will be expected to find a place to which it can be moved. Each park is under the supervision of a commanding officer, salaried by the Relief and Red Cross Funds, with authority to maintain sanitation and preserve order. In connection with the office he occupies is a small dispensary in care of a Red Cross nurse, where medical relief is administered in cases of sickness or accident.

Plumbing for a Great Charity.

The extensive and permanent buildings on the Almshouse Tract to be used as a "Home for the Aged and Infirm," would also have been ready for use had not all concerned been hampered by inability to get lumber and material as fast as needed.

The plumber's part in these buildings includes an elaborate but practical system, by which both time and material were economized, a circulating system for hot water throughout, and a complete vacuum system steam heating the whole establishment, as well as the sanitary engineering necessary for the perfect sanitation, ventilation and sewerage satisfactory to the requirements of the Board of Health. Standard goods have been used and all material is of the best quality. The "Home for the Aged," the first public building erected in San Francisco after the fire, with a capacity to care for 2,500 persons, is a two-storey structure covering a space of 600x350 feet, to be heated throughout by a vacuum system of steam heating, requiring 5,302 square feet of direct radiation. It will be a monument to the honor and fidelity of the building committee, of whom Thomas Magee is chairman. His watchful eye has been over every transaction while the unbending force of character and tireless energy of Alexander Mackie, general manager of land and building department, are pushing to completion the magnificent plans of the architect, William Curtlett, for whose courtesy, and indeed the courtesy of all the directors and officers, the plumber makes his grateful bow. For the interest of the trade I send a number of illustrations showing the style of our work and the requirements of the situation.

THREADING PIPE WITH COLD-CHISEL.

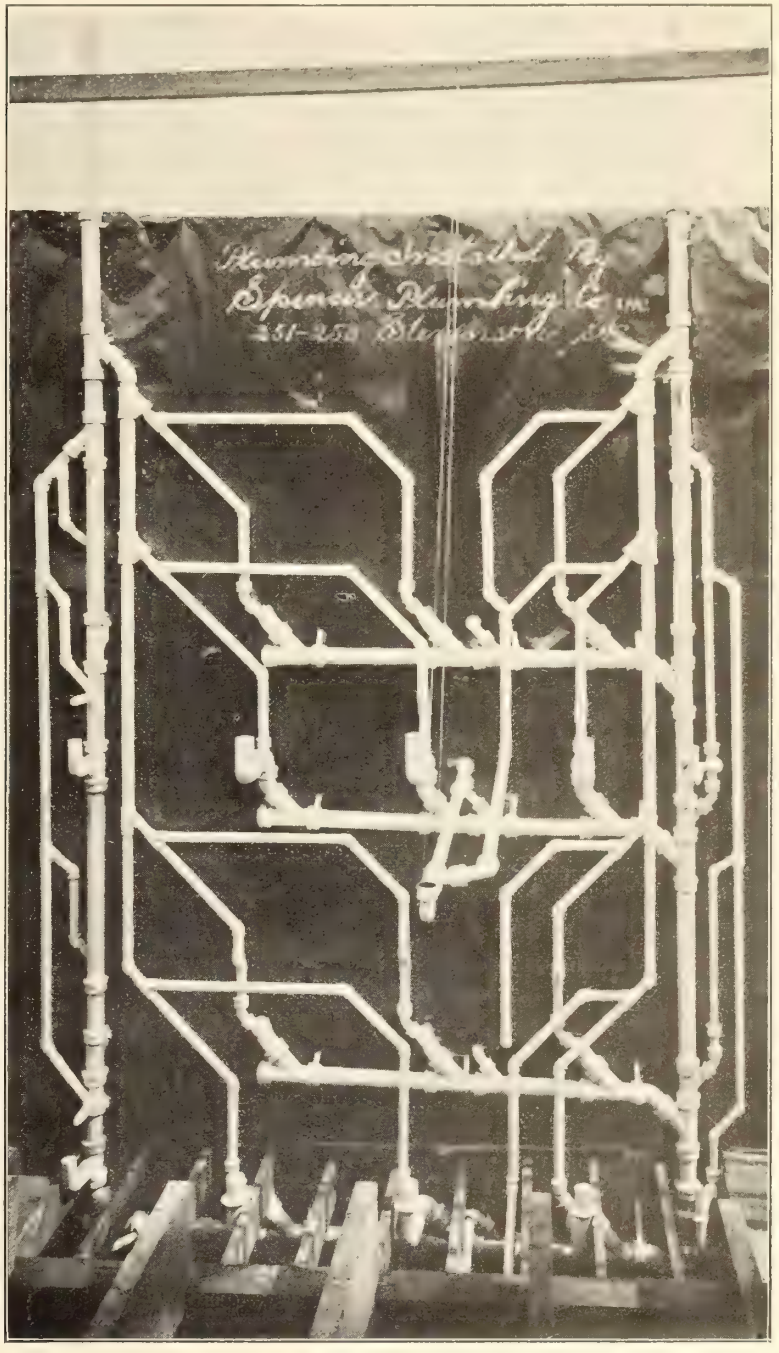
Some twenty-five years ago the piping went wrong at an important water station of one of the railroads entering Chicago. The superintendent of the water service, who is responsible for the following account of the incident, got together such men and tools as he could and hurried to the scene, says the Valve World. Arriving at the station he found the 4-in. wrought-iron pipe broken squarely off, only 2 feet of water in the tank, and no means of getting a piece of pipe from any shop cut to length and threaded inside of 24 hours.

Unwilling to interrupt the water supply and determined not to acknowledge defeat until the last resource was tried, he cut a piece of pipe to length with cold-chisels, chalked the unthreaded end, placed it in line end to end with a threaded old piece of the same size pipe, and with a two-pointed tram, one point engaging the thread of the old pipe, the other ascribing on the chalked end of the blank pipe, he followed the thread with one point, always keeping the tram parallel with the axis of the pipe.

The path of the right-pitch thread was thus ascribed by the tram point on the chalked surface of the blank end of pipe requiring thread. The spiral scribe mark made by the tram was nicked with chisels, and deepened and made continuous, until at the end of an hour and a half a good thread was cut, the job put up without a drop of leakage and without interruption of water service.

RUST ON NICKELED OBJECTS.

A good recipe for the removal of rust from nickeled objects is the following: Smear the rusted surface with grease, and after a few days rub with a rag soaked in ammonia. If some spots resist, pour carefully on a little dilute chlorhydric acid; wipe off immediately, wash with water, and when the surface is dried, apply rottenstone.



Roughing in for twenty-three lavatories in the Home for the Aged and Infirm in San Francisco. Ten lavatories not shown in this illustration have to be provided for in this group. The buildings are erected on a hillside, so that, while they are but two stories high, on account of differing floor levels four floor levels have to be provided for in the plumbing work.

SOLVING THE SEWAGE DISPOSAL PROBLEM

Plumbing Inspector of California City Describes how a Sewage Farm is Conducted.

Pasadena's sewage farm comprises 460 acres, is situated 4½ miles southeast of the centre of Pasadena, and one mile southeast of the centre of the town of Alhambra, writes A. C. Shaver in Domestic Engineering.

On account of the simple method of sewage disposal which has proven so highly satisfactory from a sanitary standpoint and so remunerative from a financial standpoint, Pasadena refers to her sewer farm with much pride.

Three hundred acres were purchased in 1887 at $125 per acre, which at that time were unimproved. Many were the obstacles encountered by the city officials who undertook to acquire the farm and secure the right-of-way for the main outfall sewer leading thereto, not to mention the difficulty encountered in the disposal of the sewage after the legal entanglements of right-of-way had been settled and the outfall completed.

In Alhambra much of the land along the outfall had been subdivided into residence and business lots and many houses and some business blocks had been erected. It was there that delay and litigation were encountered. The citizens objected almost en masse. Many conscientiously believed that should the city of Pasadena succeed in its location of sewage and sewage farm, that their homes and property would be ruined by contagion and pestilence being spread broadcast throughout their beautiful and prosperous community.

Residents Opposed Sewage Farm.

However, the farm, which had been purchased, seemed to be the only one available and the officials were steadfast in their belief that no harm could come to any one by the location of the farm and the outfall leading thereto. After many delays on account of injunction suits, the city secured a right-of-way, and the outfall was finally completed in 1892. The main outfall is of salt-glazed vitrified pipe, varying in size from sixteen to twenty inches, and is on grades ranging from one foot to three and fifty one-hundredths feet per one hundred feet.

The first pipe on the farm for the purpose of distribution was a twelve-inch pipe along the entire west side of the farm for the purpose of distribution with one lateral running at about the middle of the south field; a year ago another line was constructed running eastward from the main sewer at the northwest corner of the farm, for a distance, and then south through the centre of the farm to near the south boundary. At points from four to five hundred feet apart, both on the old and on the new lines, outlets are placed controlled by gates, whereby the sewage can all be taken out at one opening or can be taken out at several openings at the same time, as is most convenient to cover the area being irrigated. From the openings, head ditches are run from which lead many parallel-furrows from two to six feet apart covering the entire area being irrigated.

The first crops raised consisted of barley and wheat, hay, pumpkins, corn and alfalfa, all of which are now successfully raised except alfalfa, which, being a matted low-growing crop, the roots of which incline to sod, and cultivation being impossible, the solids of the sewage would collect in it on the side of the field next to the head ditch and the results were unsatisfactory conditions. It was finally decided to abandon the raising of alfalfa, although the yields were extraordinary and the profits excellent.

In 1892 sixty acres on the south end of the farm English walnuts were planted. The trees having made such splendid growth, an additional thirty acres were planted in 1898, and later another twenty-seven acres were planted, making one hundred and seventeen acres in walnuts. During the first few years corn and pumpkins are raised in the walnut groves, but as the groves come into bearing no other crops are raised. The sewage is turned into the bearing groves as soon as the leaves are well off the trees, which usually is about December 1st.

Sewage Turned Into Money.

The sewage is kept in the walnut groves until the foliage comes out on the trees about April 1st; the entire flow for the past three or four winters having been disposed of in the groves. After the sewage is taken from the groves, it is not turned back again until the following December. From April to December the sewage is used in the open fields; whether being used in the groves or in the open fields, the sewage is not allowed to run upon any one area longer than from four to ten days at a time, after which period it is turned upon another area, and as soon as the area upon which it had been running is sufficiently dry to be worked, which is usually within two or three days, it is thoroughly cultivated or plowed. Frequently the top surface is plowed under, but this is not done after every period of irrigation, as only thorough stirring with the cultivator is necessary.

The number of days that the sewage can be allowed to run upon a given area depends upon the weather and atmospheric conditions. If the weather is hot and dry, the period reaches its maximum, but if the weather is damp and the atmospheric pressure low, when such odors as are present cannot rise readily but are held close to the surface of the ground, the period is the minimum.

The first secret of the farm's success from a sanitary standpoint is the abundant sunshine and dry climate of the locality, while the second secret is the thorough and constant cultivation to which the irrigated lands are subjected, and combined with the first secret is the fact that a faithful, enthusiastic and intelligent superintendent is in charge, this happy combination produces results that are highly satisfactory to the experienced sanitarian, and surprising to those who have given but little or no thought to this method of sewage disposal.

There are times, which, however, are not frequent, when the atmospheric pressure is low, with perhaps a low fog, and the atmosphere at a perfect calm, when greater care must be exercised to prevent conditions that are unsatisfactory in the immediate proximity of an area that is being irrigated. Usually one can approach the streams and stand on their very edge without realizing that they are sewage. In the early morning when the night sewage is being discharged the flow is frequently perfectly clear; later in the day it is discolored and has a soapy appearance.

At the entrance of the farm a settling tank is located, where the very coarse materials, which but seldom are more than rags, are caught and taken out. All papers are dissolved in the long journey, and are scarcely noticeable even in small particles in the flowing sewage.

On account of the rapid growth of the city, with the corresponding increasing quantity of sewage, and the probability of an extremely wet winter, when some difficulty might be experienced in keeping the sewage on the farm, it was decided to purchase one hundred and sixty acres adjoining the original three hundred acres on the north, while there was an opportunity to purchase the same. The said one hundred and sixty acres were purchased about two years ago.

The following is from the auditor's report of the income, expenses, and profits of the farm for the fiscal year ending July 1st:

RECEIPTS.

Walnuts	$6,900.35
Grain	79.90
Pumpkins	340.28
Pasturage	37.50
Hogs	601.32
Wood	110.33
Animal burial permits	76.50
Rebate on insurance	37.69
Sundries	10.00
Hay sold	1,955.18
Hay to fire and street departments	434.04
Total	$10,538.09

DISBURSEMENTS.

Salary to superintendent	$ 875.00
Labor of men on farm	3,912.29
Labor picking walnuts	542.49
Grain and walnut bags	97.32
Baling hay	456.57
Sundry supplies	107.58
Blacksmithing and horse shoeing	15.95
Seed and grain	334.60
Veterinarian and drugs	12.85
Stock	75.80
Insurance on hay	247.50
Tools, repairs and supplies	344.31
Lumber	46.79
Freight and drayage	56.03
Horse clipping	12.00
Horses	800.00
Feed	21.38
Total	$7,958.46

The farm was purchased, and the main outfall constructed, as were several sewers in the principal streets, from funds raised by a bond issue; but all later sewers have been constructed either at the expense of districts, or at the expense of the abutting property owners.

The street sewers range from 8 to 16 inches in diameter. The topography of our city is such that 8-inch sewers, which are the smallest used, are sufficient for about 80 per cent. of our streets, while the trunk lines range up to 16 inches in diameter. No 8-inch sewers are laid on grades less than six inches per hundred feet.

The quantity of sewage now being discharged ranges from 1.0 cubic feet per second minimum, at about 7 o'clock a. m., to 2.4 cubic feet per second maximum, at about 11 o'clock a.m., the average being approximately 1.7 cubic feet per second, or 85 miner's inches, which is equivalent to 1,100,000 gallons per twenty-four hours.

We realize that where the quantity of sewage is extremely large and the ocean can be reached, that the outfall thereto is necessary to take care of the winter sewage, unless very large farms are owned. From our experience in Pasadena it appears evident that the value of the sewage of any city in an arid country is only less than the value of irrigating water to the extent that the location in which, and the crops for which, it can be properly used are more limited; while on the other hand, for such crops as it can be properly used it has a greater value than irrigating water to the extent of its fertilizing value, which is large.

It is our belief that Pasadena is the most thoroughly sewered city in America.

W. HOLLY, MONTREAL
Associate Royal Sanitary Institute, England, with the Robert Mitchell Co., Montreal.

ACCEPTED NEW POSITION.

W. Holley, Montreal, who has contributed several interesting articles to the pages of The Plumber and Steamfitter, and from whose pen others are promised in future issues, has resigned his position with the Robert Mitchell Brass Mfg. Company, Montreal, to join the staff of Henry Morgan & Co., of the same city, who are expanding their plumbing department. Mr. Holley will be in charge of the department. He is a graduate of the Institute of Royal Sanitary Science, of London, Eng.

Business methods of five years ago are ancient to-day. Those of to-day will be out-of-date five years hence. Are you keeping up with the band?

BRITISH ROYAL SANITARY INSTITUTE

By W. Holley, Associate R.S.I., Montreal.

Perhaps the one great feature which will distinguish the present age from that of any other period in the history of the world will be the rapid development of scientific knowledge and its adaptation to practical ends. During the past fifty years very great results have been accomplished on these lines by the formation of societies, institutes, and similar bodies amongst men interested in some one or other phase of practical science. This is particularly clear when we remember the work of such bodies as the Royal Institute of British Architects, the Institute of Civil Engineers and the American Institute of Mechanical Engineers, and others.

In the realms of sanitary science and practical sanitation the Royal Sanitary Institute is the highest authority and the one to which much of our available knowledge on these subjects is due. Being founded in the year 1876, the council of the institute adopted as its motto the Latin quotation "Salus generis humani," and started from the groundwork of the public health in its investigations and conferences on sanitary questions.

The institute is made up of members, life members and associates; men—and also some women—who are identified with some phase of sanitation. It includes amongst its adherents most all the medical officers of health appointed by the British Government and governing bodies, very many civil engineers, architects, philanthropists and scientists. The scope of its work since its inception has very rapidly grown, until now every phase of engineering or science, which in any way affects the public health, comes within the scope of its consideration. This will be, perhaps, better understood when subjects such as the following are brought to mind: "Hygiene and Preventive Medicines," "Hygiene of Special Trades and Professions," "Municipal Administration," "Water Supply," "Sewerage," "Refuse Disposal," "Heating, Lighting and Ventilation," "Personal and Domestic Hygience," "Food Adulteration and Supply" and kindred subjects.

The work of the institute of acquiring and spreading knowledge is accomplished by means of conferences from time to time in different large centres; by exhibitions of modern sanitary apliances, etc.; sessional meetings held at different local centres; by the appointment of expert scientists to examine into and make research in disputed questions, or in matters regarding which little accurate knowledge is available (as, for instance, the standardization of disinfectants; the effects of smoke in the air we breathe, etc), also by the publication of a monthly journal in which the transactions of the institute and its meetings are recorded. Nor is this all. Series of lectures and demonstrations on special subjects are delivered to students throughout the whole year, and examinations held in several branches from time to time in different centres throughout Great Britain and the colonies. These subjects include: "Food and Meat Inspection," "Hygiene in its Bearing on School Life," "Sanitary Science as Applied to Buildings and Public Works," "Inspection of Nuisances, etc."

Since its inception the institute has accomplished much in a definite way besides educating public opinion on matters of sanitary importance. For instance, the value of the training and the diplomas granted by the institute has been recognized by the British Government, with a result that at this time no person can be appointed inspector of food and meat by a governing body without such person holds this diploma. Within the Metropolitan area (nor to an office under the Local Government Board) no one can be appointed an inspector or health officer who does not hold the diploma, and municipal authorities generally are requiring candidates to be holders of the diploma of the institute. The various universities and educational authorities know the value of the special course of the institute for teachers, and are giving great preference to such as have passed through the course.

An exhibit and permanent museum is maintained in London in connection with the institute, where examples of up-to-date sanitary appliances and fixtures are on exhibition, also very many examples of ill-planned and unsanitary work collected from different parts of the country. These specimens are constantly being added to and are of inestimable value for demonstration to students.

The institute is represented in Canada by several high authorities in various lines, as, for instance: Prof. Nobbs, of McGill University, professor of architecture; J. E. Dore, city sanitary engineer of Montreal; Prof. Starkey, professor of hygiene at McGill; Dr. Laberge, city food inspector, Montreal, and several men of importance in the other large centres of Canada. The work of the institute is making marked progress, being represented and examinations being held in the various subjects at Hong Kong, South Africa, Australia, New Zealand and some points in India. Within the next few years more of a definite nature may be expected here in Canada regarding its work.

The offices and museum are located in Margaret street, London, W., and any communication from persons interested in sanitation would be answered by its registrar.

The contract has been sub-let to M. Isbister & Son for the heating and plumbing of the National Trust Co. block at Saskatoon, Sask.

AMERICAN WATERWORKS ASSOCIATION CONVENTION

About 700 delegates and friends gather in Toronto—Brass goods manufacturers in evidence with exhibits.

The 27th annual convention of the American Waterworks Association is being held in Toronto this week, the sessions occupying from Tuesday, June 18th, to Saturday, June 22nd. About seven hundred delegates and representatives of brass manufacturing and waterworks supply concerns, trade publications, etc., are present, a large number of ladies accompanying the delegates, who include all classes of men interested in the improvement of waterworks systems in the United States and Canada. A fuller report of the convention's doings will be published in the next issue of Plumber and Steamfitter, the convention being in progress as this issue goes to press.

Interesting Addresses.

Some very interesting subjects are to be discussed, many of them being of interest to plumbers, steamfitters and sanitary engineers. Dr. Wm. P. Mason is to deliver two addresses an "The Action of Water on Lead and Zinc," and "A Peculiar Instance of Contamination of Ground Water." Dr. Geo. W. Soper is to read a paper on "Sanitary Protection of Surface Water Supplies." Jas. N. Caird will discuss the "Possibility of Water in Mains Under Pressure Becoming Polluted from External Surface." A. W. Hardy is to speak on the subject of "Water Supplies for Private Fire Protection Service." Addresses on technical subjects are to include the following: "Cleaning Water Mains," by Park Woodward; "Repairing a Broken Force Main," by C. W. Miles, and, "Repairing a Submerged Pipe Line," by H. A. Lord, etc., while very interesting addresses are to be delivered, including a description of "The Gas Producers' Plant at St. Stephen, N.B.," by F. A. Barbour, and "How Can Politics be Eliminated from the Management of Municipal Waterworks?" by J. M. Diven. The reading of papers on these subjects and the discussions which will follow, are certain to be of considerable educational value to all interested in waterworks development, a class of work which is closely akin to the plumbing and steamfitting trade.

A valuable adjunct to the convention is the exhibition of waterworks machinery and supplies. Many of the manufacturers of these goods in the United States and Canada made splendid displays of the various articles manufactured at their plant. Those of particular interest to readers of Plumber and Steamfitter were, of course, the displays of brass goods.

Exhibits of Brass Goods.

The only Canadian manufacturers to exhibit were the Jas. Morrison Brass Mfg. Co., and the Canadian Fairbanks Co., both of Toronto. The latter had a small display of valves and other brass goods, while the Morrison Co. had one of the largest exhibits at the convention, showing a full line of their corporation waterworks service brass works, as well as a number of engineers' clocks, recording pressure gauges, etc. Chas. World and A. Betton, Ontario sales representatives, were in charge, and all Canadian delegates were reminded that "Made in Canada" waterworks brass goods could be secured.

The Mueller Mfg. Co., Decatur, Ill., had probably the largest representation of any firm, they being represented by Messrs. Fred. Mueller, Henry Mueller and wife, and H. F. Clark, of Decatur; Oscar Mueller and wife, New York, and R. M. Hastings, Buffalo, N.Y., their Ontario representative. They had a very large exhibit, comprising all classes of water, gas and plumbing brass goods, including curb cocks (stop and waste), brass furrows, bath, sill and basin cocks, wash trays, bibs, compression and fuller work, self-closing bibs, solder nipples and unions. They also showed several specialties, such as their sand screen and strainer and their water and gas tapping machines, their claim being that 95 per cent. of the tapping machines in use in the United States and Canada are made by their company.

The Hays Mfg. Co., of Erie, Pa., were represented by C. J. Nagle, the Canadian sales agent of their company, and well-known to the trade throughout Canada. Amongst the leading lines included in their display were the Hays extension service boxes, corporation cocks, lead goose necks, iron body clean outs, and general waterworks and gas supplies. Mr. Nagle states that the extension service box made by the Hays Company is in extensive use in western Canada, large orders having been received from Edmonton, Calgary, Regina and other cities. All their lines of waterworks supplies are thoroughly tested to 250 lbs. or over before shipment. The company use the motto. "The Goods That Please."

Full Lines on Display.

The Glauber Brass Mfg. Co., of Cleveland, had a nice exhibit in charge of I. Herzbrun, special traveling representative. Their display consisted mostly of waterworks brass goods, a complete line of inverted curb stops and stop and wastes being shown, from the smallest to the largest sizes. Other lines on display were different styles and sizes of corporation cocks, goose-necks for water connection, stop and stop waste cocks for plumbers' use, service and meter cocks for gas companies, and an assortment of compression and fuller work, both brass finished and nickel-plated. "They never leak and they always work easy" is the Glauber motto.

United Brass Mfg. Co., Cleveland, O., was represented by W. J. and S. P. Schoenberger, of Cleveland. They had a similar line of brass goods on the display table, including a number of United lead goose-necks, the joints of which were wiped by the Corcoran wipe joint machine, sold by this company. A demonstration of the splendid work of this machine was also made at one of the departments of the Toronto waterworks. The Messrs. Schoenberger were kept busy explaining the work and system of operation of the wipe joint machine, it creating considerable interest amongst the delegates.

Other exhibitors included,: the Waterworks Equipment Co., 180 Broadway, New York, lead wool for caulking joints under water; Worthington Pump Co., New York, meters; National Water Main Cleaning Co., 27 William street, New York, iron pipe cleaners; Thompson Meter Co., Brooklyn, N.Y., meters; the Pito Meter Co., New York, testing machines; Neptune Meter Co., New York, meters; Cancos Mfg. Co., Philadelphia, black squadron packing; the Union Water Meter Co., Worcester, Mass., and the Wykoff Supply Co., Elmira, N.Y. The last named company exhibited a section of wooden water pipe bound by metal straps, which had been in service under 30 lbs. of pressure regularly for 42 years.

NEW WATER WORKS.

Extensions are to be made to the Vancouver Water Works. A new main is to be laid across Coal Harbor, and 12-inch mains are to be laid on Smyth and Beatty Streets. The new work will cost about $10,000. Mr. Madison is superintendent of water works.

City Engineer Kerr, of Ottawa, says that the water supply of the city is inadequate. At present 14,000,000 gallons of water are consumed per day, while the safe working capacity of all the pumps is only 20,000,000 gallons. He says the capacity should be at least 28,000,000 gallons, and in order to secure this recommends the installation of a duplicate set of pumps.

Yorkton, Sask., has under consideration the installation of a water works system. Mayor W. D. Dunlop has been inspecting a number of water works plants in the United States with this object in view.

Niagara Falls is to have an improved waterworks system on which $40,000 is to be expended.

Welland, Ont., has decided to spend $70,000 on a new water works system.

Aylmer, Ont., is to spend $60,000 on a new sewerage system.

PIPE AND STEAMFITTERS' TOOLS

A catalogue of 37 pages containing full price lists and illustrations of pipe and steamfitters' tools has been issued by the Canadian Fairbanks Company. Amongst the articles illustrated are pipe cutters, wrenches, tongs, stocks, dies, drills and threading machines. All those interested in these supplies may secure a copy of this booklet by applying to the company, mentioning this paper.

STEAM SPECIALTIES.

Darling Bros, manufacturers of water heaters and steam fittings, Montreal, have issued a 24-page booklet illustrating and describing their feed water heaters and purifiers, pressure valves, steam traps, steam pumps for marine boilers, steam separators and force feed lubricators. All interested in these lines may secure this interesting booklet by applying to the company, mentioning this paper.

The Board of Education, Sydney, C.B., are considering the advisability of erecting a new high school building. The proposed building would cost at least $40,000.

HOW TO LOWER FIRE INSURANCE RATES

Standard of Buildings Outlined by the Underwriters' Association

Fire insurance premiums are probably part of the annual expense of every reader of Plumber and Steamfitter, so a few hints as to how premiums may be lowered might be permissible.

All fire insurance is based, as regards its cost to the insured, upon a key rate. This key rate is arrived at by setting a certain amount per hundred dollars as the cost of a risk consisting of a building regarded by underwriters as a standard; the amount charged on a standard building being determined by the municipal fire protection appliances available. This rate is increased or decreased according to the extent to which the building to be insured falls short of, or is an improvement on, the standard of building decided upon as a basis. The location of a building in respect to fire stations and hydrants, and in respect to its accessibility or non-accessibility by fire fighting apparatus is also a factor in the increasing or decreasing of a premium rate. The standard of building set by the Canadian Underwriters' Association is as follows:

Standard of Building.

(1) Walls of brick or stone, brick preferred. If brick, 12 inches (1 1-2 bricks) in thickness at the top storey; if stone, 16 inches in thickness at top storey; extending through the roof and forming a parapet not less than 12 inches high, coped on all sides. If of brick, the walls must increase in thickness by one-half brick (4 inches) for each storey below the top; if of stone, 5 1-3 inches. Such increased thickness to be used for beam ledges, or the walls corbelled to provide the same.

(2) Area: The ground area to be not greater than 25x100 feet.

(3) Height not more than three storeys or 40 feet.

(4) Cornices of incombustible material.

(5) Roof; Flat, covered with slate, metal, tile or approved felt and gravel, with no attic, roof-space or cock-loft. (Mansard roof not permitted.) No sawdust filling or vertical opening.

(6) Elevators and stairways cut off by brick wall or by concrete plaster on metallic lathing set on metallic studs, continued from basement up through roof, with the communication at each floor protected with approved tin-covered doors, or metal doors, with, if lighting necessary, wire glass lights. All weights, cables and other elevator connections (except motor) to be enclosed in elevator shaft. Sills incombustible. Skylight over shaft to be of thin glass, covered with an approved wire guard.

(7) Skylights (if any) of wired glass set in metal frames.

(8) Floor lights (if any) not less than three-quarters of an inch thick.

(9) Windows and doors when exposed (that is, when within 100 feet of another building) to be of wired glass in metal frames; or to be protected by a water curtain; or by approved tin-covered doors and shutters which can be opened from the outside.

Heating and Lighting.

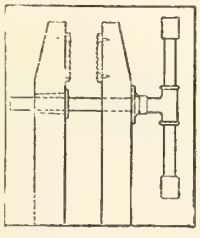
(10) Flues: Walls of flues to be not less than 8 inches thick, lined with firebrick, well-burned clay or cast-iron pipe. If steam boiler is used, throat capacity of flue not to be less than 96 square inches. All floor timbers to be trimmed at least four inches from the outside of the flue.

(11) Heating by hot water or steam at low pressure.

(12) Lighting by gas, with rigid fixtures.

(13) Interior finish, open, or lath and plaster, or metal.

With this standard before him as a guide, an insurance company's inspector, if called upon to inspect a prospective risk, goes carefully over it, noting to what extent, and in which particulars it falls short of, or is an improvement on, the standard. Occupancy and the nature of the business carried on in the proposed risk; means of protection; condition of building, and management, have all, of course, their effect on the premium rate.



Easily Made Pipe Vise.

What Increases Cost.

Some of the things which increase the cost of insurance, while not being, strictly speaking, part of the construction of the building, and which can, therefore, be remedied by an occupant together with the charges made for the existence of the same, are:

Stove pipes passing through floors or partition unprotected, 50 cents; through windows, roof or wall, with double metal chimney, 50 cents; not protected, $1; entering bottom of flue vertically, 25 cents; entering flue in attic or unused room, 25 cents.

Floor beneath stoves unprotected, 5 cents.

Bottom of elevator shafts used for closets, or for waste, 50 cents.

Swinging gas brackets, or bracket lamps unprotected, for each, 1 cent.

Untidiness, rubbish, ashes, etc., especially in cellar or attic, 25 cents.

Packing material not in bins, 15 cents.

Thin, worn floors, broken plastering, broken windows, etc., 10 to 25 cents.

Fuel, consisting of shavings or waste, 50 cents.

Empty boxes, rubbish, etc., in rear yard, alley, window recesses, or under sidewalk or gratings, 10 cents.

Open Lights Condemned.

Open lights in show windows or electric bulbs covered with tissue paper or paper shades, 25 cents.

Sawdust on floors, sawdust spittoons, etc., 25 cents.

Kerosene used to sprinkle floors, 25 cents.

Ash and waste cans not made of metal, 10 cents.

Furnace top within four inches, if brick, or within 12 inches, if portable, of wooden beams or ceiling, 10 to 25 cents.

Fire-places, hearths, or wooden beams, or floors within 16 inches of the fireplace; or wooden fire-boards, or summer pieces or unprotected wooden mantels; or open stove pipe holes, 5 to 25 cents.

Electric lighting or any other system, with installation not in compliance with underwriters' rules; or are lights unprotected by tight globes or metal screens, 25 cents.

Crowded merchandise, without proper aisles, opposite or too near windows, or overloading, not less than 25 cents.

The use of kerosene lamps is also liable to increase the cost of insurance unless the following safeguards are adhered to: Lamps to be supported by substantial metal hangers, there being a proper heat-guard to protect the hanger and the material overhead. Only approved metal or metal cased lamps should be used. Central draught lamps should never be used.

Simple Means of Protection.

Then, of course, any means of protection from fire, which are provided by the insured and which underwriters deem practical, are always taken into consideration when the rate is being decided upon. Some of the simple means of protection which considerably lessen insurance rates are:

Casks of water or filled pails on each floor, to the extent of six pails for each 2,500 square feet of floor space; or two approved chemical fire extinguishers for each 2,500 square feet of floor space (if there is any quantity of oil or paint on the premises, 3 of the 6 pails should be kept filled with sand); automatic sprinkling systems; watchmen with portable clock or electric detector; automatic alarm; proper receptacles provided for all oily waste; and a generally clean and tidy building.

EASILY MADE PIPE VISE.

The accompanying sketch shows how a handy repair-man made a pipe vise from an old carpenter's vise. Take an old coarse rasp; break it in half and draw the temper at the ends to allow drilling and countersinking for screws, which should be used to fasten the two halves to the jaws of the vise as shown. Fasten one with the teeth pointing up and the other with the teeth down.

NEWS OF THE TRADE IN CANADA

Jas. Boxall, of Boxall & Matthie, Lindsay, was a visitor in Toronto last week.

Geo. F. McCully, plumber and gasfitter, Hamilton, has assigned to W. G. C. Boyd.

John Walter Quipp, Montreal, has been registered to carry on a hardware and plumbing business.

John Walter Quipp, Montreal, has been registered to carry on a hardware and plumbing business.

Pierre Avila Gouin has been appointed curator for Alex. Landry, plumber and tinsmith, St. Celestin, Que.

The premises of W. W. Grenville, manufacturer of pipe coverings, Thorold, were recently damaged by fire.

G. & E. Blake, St. John, N.B., have the contract for heating and plumbing for the new Royal Bank building, which is nearing completion.

The contract has been sub-let to M. Isbister & Son for the heating and plumbing of the National Trust Co. block at Saskatoon, Sask.

Staunton & Mitchell, 159 York street, Hamilton, have recently opened a plumbing shop and have been successful far ahead of their anticipations.

Robert Sigouin and Alphonse Paquin, Montreal, have been registered to carry on a plumbing business in that city under the firm name of Sigouin & Paquin.

Caleb Narcisse Piedalue and Gustave Papineau have been registered to carry on a plumbing and roofing business in Montreal under the firm name of C. N. Piedalue & Co.

Jas. Sinclair, who has been continuously engaged in the tinsmithing and plumbing business in Ingersoll since 1874, is erecting a fine brick store and workshop, which he expects will be ready for occupancy very shortly.

R. G. Sturgeon, of Hutchinson & Sturgeon, Peterboro, was a visitor in Toronto last week. Mr. Sturgeon is interested in the new Peterboro Boiler and Radiator Co., which is erecting a factory at Hastings, Ont.

Michael Walsh, of the firm of Michael Walsh & Co., 33-35 Vitre St., Montreal, and one of the oldest master plumbers in the city, is dead. One of the sons is J. E. Walsh, the present secretary of the Master Plumbers' Association.

R. F. Thomas, of Thomas & Smith, Chicago, manufacturers of the Thomas air washer and hot air engine, has been a visitor in Toronto a couple of times this month conferring with Cluff Bros. regarding the rapid extension of their business in Canada.

The Standard Plumbing Co., of Winnipeg, have a contract to install a similar system in the new public school in Selkirk, Man., which is being built to replace the fine building destroyed by fire a year ago. As the new building will have eight class rooms and an assembly hall, the contract is an important one.

Cook, Potts & Smith, of Regina, have been awarded the contract for installing the plumbing and a steam heating and ventilating system in the new Alberta school building. The new school is a handsome structure designed by Architects Story and Van Egmond. The specifications call for the Pease-Waldon system of heating and ventilating.

The plumbing contract for three of the public schools of Ottawa has been awarded to J. R. McLennan of that city. Superintendent Garvock states that the fixtures will be superior to anything heretofore placed in the schools of Canada. The figures of the successful tenderer on the three schools were as follows: First avenue, $4,280; Osgoode street, $3,788; Percy street, $3,850.

The Wolverine Brass Co.'s bylaw, granting a $20,000 loan, 10 years' exemption and other concessions to the Wolverine Brass Co., was carried by Chatham, Ont., voters on June 5 by a surprisingly big majority. The vote stood 1,271 to 91 in favor of the bylaw; the vote required to carry the bylaw being 1,025. Building operations will be commenced at once.

The King Radiator Company, Toronto, has been incorporated, with a capital of $100,000, to manufacture radiators and plumbers' and steamfitters' supplies. Provisional directors: W. R. P. Parker, Geo. M. Clark, John A. McEvoy, Gordon Russell, Ethyl M. Lindsay and Violet Waldock, all of Toronto. The Warden King, Cluff and Somerville interests are behind the enterprise. Robert J. Cluff, of Cluff Bros., Toronto, has been appointed Ontario attorney of the Warden King Company, Montreal.

The conference between the Hamilton journeymen and the master plumbers did not result in a settlement of the strike. The union representatives agreed to accept a minimum rate of 35 cents an hour, the agreement to last for one year. The bosses wanted the standard rate fixed at 27½ cents an hour, but said they would pay good men 35 cents an hour. As this would mean that a majority of the journeymen would be paid the lower rate, the proposition was rejected.

Well-Known Men at Corner Stone Laying of King Radiator Company's Factory.

BUILDING NOTES.

It cost Edmonton about $220,000 to keep warm last winter. This has been revealed as the result of an investigation into the size of her coal bill. The sum is about double that of the winter of 1905-1906. The increase comes from a rise of $1 on the ton of coal, and the more severe weather. Of course, the growth of the city is also a factor.

Building is active at Strathcona. Over a million dollars worth will be undertaken this season. Some of the new buildings are: a hospital, $60,000; collegiate, $65,000; St. Louis Hotel, $25,000; Bank of Commerce, $20,000; brewery, $70,000; three churches, $80,000; Sheppard business block, $15,000; A. G. Baalim, ditto, $18,000. Work is commencing on the new C.P.R. station. It is to cost $30,000. McDermot & Son, of Winnipeg, are the contractors. The C.P.R. expect to spend about $150,000 this summer in terminal improvements.

Lacombe, on the Calgary and Edmonton line of the C.P.R., has a building boom on its hands. Over $200,000 worth will be undertaken this year. A number of business blocks are going up. Among those who will build are the following: the Adelphi Hotel, cement, $50,000; H. Urquhart, store, $15,000; H. A. Days, stores, $15,000; Morris & Taylor, warehouse, $2,500; A. D. Watson, blacksmith shop, 700; W. F. Brett, addition to store, $2,000; C. R. Dunke, store, $2,000.

GROUP OF WELL-KNOWN MEN

The corner-stone laying of the King Radiator Co.'s factory a fortnight ago brought together a number of well-known supply men, as will be seen in the accompanying illustration. The "twins," "Bob" Cluff and "Fred" Somerville, will be recognized in the front of the group on the left side. The second to the left is Architect F. H. Herbert, and the third M. J. Quinn, of Cluff Bros. W. J. Cluff is wielding the trowel on the corner of the building. D. McArthur, of the Standard Ideal, is in a characteristic pose, with a cigar against his white vest, and over his left shoulder Lorne Somerville, of Somervilles, Limited, has tried to disguise himself behind a broad smile. The third from the right side is Dr. McMahon, financially interested in the King Radiator Company, and next him is Geo. Burman, who is to be superintendent of the radiator works.

PLUMBING AND HEATING MARKETS

MONTREAL PLUMBING MARKETS.

Montreal, June 18, 1907. The volume of business done in the plumbing trade at present is perhaps unparalleled. A prominent member of one of the supply firms stated that he could not remember of any period in the history of the trade in which as much business was transacted. All lines of plumbers' supplies are being enquired for briskly and no one line can be singled out as being in greater demand than another. The enormous amount of building operations, being enlivened by the continued favorable weather, is responsible for the great increase of business done.

Although a very large number of orders are coming in, they are not being filled and delivered as promptly and satisfactorily as they might be on account of the inability of the transportation companies to handle the goods, owing to the scarcity of cars. To distances of from 50 to 200 miles the railroads are adopting the policy of partial shipment delivery, sometimes only a third or a half of a shipment being delivered. As a number of complaints are arriving every day regarding delay a large number of tracers are out, so many that it is said the railroads have ceased to take notice of them.

Iron Pipe.—A great scarcity continues in certain sizes of iron pipe, from ¼ inch up to 2 inch, due probably to the fact that the manufacturers have great difficulty in securing supplies of raw material from the United States, and also to the large increase in demand. Prices continue firm with no changes to note.

Soil Pipe.—Both pipe and fittings are experiencing a strong demand, with adequate supplies. Prices continue unusually low, owing to strong competition, and, consequently, price-cutting.

Lead Pipe.—The business in lead pipe has increased very much and is now unusually brisk. Prices continue firm and unchanged.

Brass Goods.—The situation in brass goods and fuller work remains unchanged, with strong demand and firm prices.

Enamelware.—Supplies are increasing, despite the crippling of the Amherst works. The Port Hope factory is working at high pressure and is doing much to keep up the supply. The supply houses, in order to satisfactorily cope with increasing demands, find it absolutely necessary to make provision for at least two months ahead.

TORONTO PLUMBING MARKETS.

Toronto, June 19.—Activity is general throughout the local plumbing markets, with all the regular lines in strong demand. Toward the end of last week a marked increase was evidenced in the volume of trade; this may be due to the fact that certain work which has been held up on account of the unsettled condition of the labor market is now being pushed forward with as much expediency as the present unfavorable circumstances will permit. The local plumbers' and steamfitters' strike has now been on for over a month and naturally tends to retard trade in plumbing supplies. How long this unsatisfactory condition of affairs will last no one can say, but up to the time of writing, no settlement appears to be in sight whereby this serious impediment to business may be removed.

Iron Pipe—Pipe continues to be very scarce, especially sizes three and four-inch—though no change has occurred in the price. Delivery is very slow and uncertain, taking anywhere from eight to twelve weeks. We quote on one-inch black, $5.45, and one-inch galvanized, $7.10.

Soil Pipe—No change in price since last quoted, and the market continues to show little activity. We quote: Medium and extra heavy pipe and fittings, up to 6-inch, 60 and 10 to 70 per cent.; 7 and 8-inch pipe, 40 and 5 per cent.; light pipe, 50 per cent.; fittings, 50 and 10 per cent.

Solder and Lead Pipe—In good demand with prices unchanged. Wiping solder is 23c. per lb., and lead pipe is still five off.

Compression Work—Now quoted at 57½ per cent.; fuller work is still held at 65 per cent. discount, though one firm is still quoting as low as 70 per cent.; ground work is quoted anywhere from 55 to 60 per cent.

Cast Iron Fittings—Still in good demand, with the price firm and unchanged at 57½ per cent.

Enamelware — Prices are unchanged. This class of goods are in strong demand, but their sale is held back considerably through the influence of the plumbers' strike. Price-cutting has largely ceased, and practically all the large firms are now adhering to the January price list. The departmental stores seem to be getting a supply of enamelware from supply house sources.

Metals—The ingot copper market is in a peculiar condition with some possibility of a big slump. Prices keep firm at $26.50 for lake ingots, however, and bars and sheets from $35 to $38. Lead is firm at $5.50 for imported pig, and ingot tin strong at $46. The pig iron market is very strong. Dealers' buying prices for old material per pound are: Heavy copper and wire, 19½c.; light copper, 17c.; heavy red brass, 17c.; heavy yellow brass, 14½c.; light brass, 10c.; heavy lead, 4½c.; scrap zinc, 4½c.; No. 1 wrought iron, 12c.; No. 2 wrought iron, 6c.

TORONTO PLUMBERS' STRIKE.

After over a month's duration the plumbers' and steamfitters' strike is still in operation and up to the time of going to press there is not a single indication that a settlement is in sight.

The following notice is conspicuously displayed in each of the large shops, which in the aggregate employed ninety per cent. of the striking union men:

"Open Shop Notice.—This firm has determined, in accordance with the policy of the Master Plumbers' Association:

"1. To maintain an open shop in the plumbing and steamfitting department of this business.

"2. Not to enter into any arrangement which provides for the discharge of any person employed at the time of the settlement of any strike declared in this shop."

The employers refuse to recede from the above stand and the striking plumbers and steamfitters seem just as determined to stand by their demands for higher pay, recognition of the union and all the other demands formulated by them and presented to the employers at the beginning of the strike.

Meanwhile little new work is being attempted and the employers are looking after the jobbing as best they can with greatly reduced staffs. The strike is causing a big financial drain on the union, but at present it looks as if the controversy will not be settled at least till the early fall, when the shoe will begin to pinch a little tighter on both sides.

Out of a regular staff of ninety men the plumbing firm of Purdy-Mansell have about twenty-five men at work, and as this firm may be taken to fairly represent the position of the other employers, it is apparent that the latter have men equivalent to at least twenty-five per cent. of their former staffs at work. On the other hand the striking plumbers claim to have one hundred and seventy men back at work on the union's own terms. As there is a total membership of about six hundred in the local union, the situation seems to be about a saw-off, with, roughly speaking, twenty-five per cent. of union men back at work and twenty-five per cent. of the former staffs of the large employers filled by non-union men.

U. S. TRADE NOTES.

A second company has been organized at Detroit to manufacture pressed steel enamelware. The Pressed Steel Sanitary Company is the new concern's name. Baths, lavatories, sinks, etc., will be stamped by powerful presses and then enamelled.

The seamless bathtubs made by the Seamless Bath Tub Company, Detroit, Mich., are the subject of an admirable, stiff-covered pamphlet of 28 pages printed for distribution in the trade. It describes and illustrates in detail the process of making the tubs. The trade will be interested in the views of the types of tubs made, with the weights and price lists and with the views of legs and the methods of fastening them. One of the products especially noteworthy is a tub porcelained on both sides. Incidentally, where desired, the company is burning reproductions in color of crests in the porcelain, one case being the reproduction of a crest for tubs furnished for the new Hotel Pontchartrain in Detroit.

A noteworthy argument for good plumbing, having special reference to the use of lead pipe in plumbing work, has been published by the National Lead Company. It will be particularly pleasing to plumbers, for the reason that it is written in a vein that will enlist the interest of the general reader and that it contains some convincing statements regarding the advantage of having a system tested periodically, even after it has been put in first-class working order, to be sure that it is always in proper condition. As an argument for lead pipe it is, of course, strong, although mention is made of the limitations which the use of lead has to meet. Among its artistic illustrations are views to show the long life of lead pipe on the one hand and the short existence of galvanized iron on the other. A copy of the booklet can probably be had for the asking on addressing the company at 100 William Street, New York City.

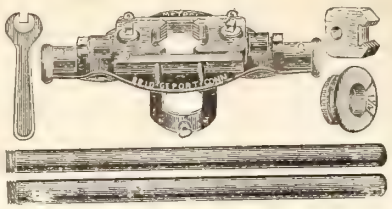
Jardine Hand Drills

New Designs

Get samples of these machines for your show room. They will interest your customers and prove a good investment.

It pays to sell the best Tools.

A. B. JARDINE & CO.
HESPELER - - - ONTARIO

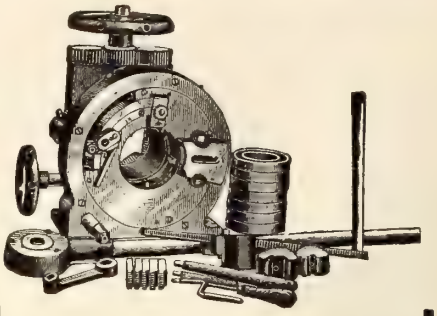


THE ARMSTRONG MANUFACTURING CO.
317 Knowlton St., - Bridgeport, Conn.

Manufacturers of the Genuine Armstrong Stock and Die, Malleable Iron Hinged Vises, Pipe Cutters, Pipe Wrenches, Bard Adjustable Bushings, Ratchet Attachment for Stock, Pipe Threading and Cutting-off Machine—Hand and Power. Our goods are sold by all Jobbers.

CATALOG MAILED ON REQUEST

A Certain Sense of Satisfaction



goes with every MERRELL PORTABLE HAND MACHINE, PIPE THREADING and CUTTING MACHINE. We build them that way.

For doing ALL kinds of threading—under ALL conditions—labor trouble and faulty material included—where speed, durability and ease of control count for something, our word to you is to investigate the MERRELL.

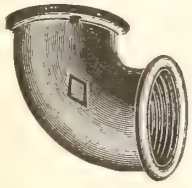
Whether it be stationary or portable—hand or power driven—30 DAYS FREE TRIAL must prove conclusively that your choice should be the MERRELL.

This Portable Hand Machine has encased gears, MERRELL standard quick opening and closing die-head, and the latest improved Cutting-off Knife.

Let us tell you more about this machine—The Chasers, Vise and the large range of work covered.

Catalogue for the asking.
Quick shipments.

THE CANADIAN FAIRBANKS CO.
Sole Agents for Canada Limited
MONTREAL, TORONTO, WINNIPEG, VANCOUVER

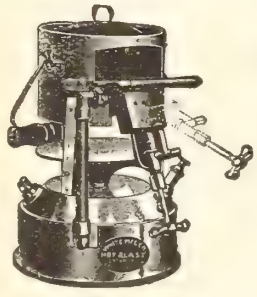


"Diamond" brand Fittings

hold the market because of proven superiority. The finish is smooth, the threads perfect, the material is first-class.

WHOLESALE ONLY

OSHAWA STEAM & GAS FITTINGS CO., LIMITED
OSHAWA, CANADA

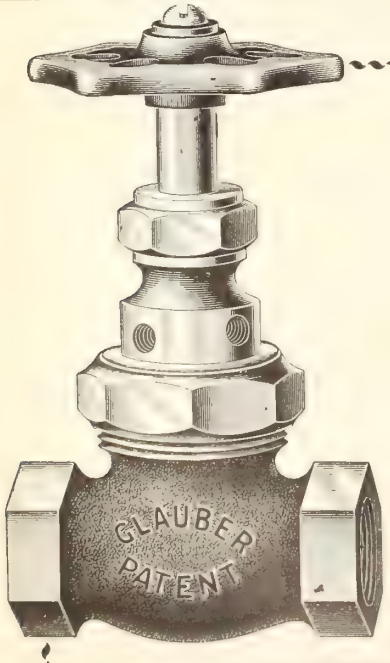


HOTTEST ON EARTH

Our Bonanza Furnaces are known to produce more heat with less fuel than any other make. Jobbers sell at factory prices. Satisfaction guaranteed or money refunded.

No. 38—Price, each, ***$7.80*** net
No. 39—One size smaller, ***$5.85*** net

THE TURNER BRASS WORKS
53 MICHIGAN STREET, - CHICAGO, U.S.A.



Automatic

SELF DRAINING COMPRESSION

STOP AND WASTE COCK

The Only Self Draining Cock Made

Patent Features, Two holes in bonnet—Upper hole for air—Lower hole for waste—insures perfect circulation and automatic drain, no matter in what position cock is installed.

Interchangeable right or left. Quick operating stem. Made to stand Boiling Water as well as Cold.

GLAUBER FIVE YEAR GUARANTEE PROTECTS YOU

A Trial Dozen Will Make You Order More

CLEVELAND, GLAUBER BRASS MFG. CO. OHIO

If you can use High-grade Low Down Compression Basin Cocks with China Index Handles, ask for the Acme Brass Works Nos. 4, 5, 6 and 7 Basin Cocks, which are just what you want. They are the acme of perfection in style, workmanship and durability.

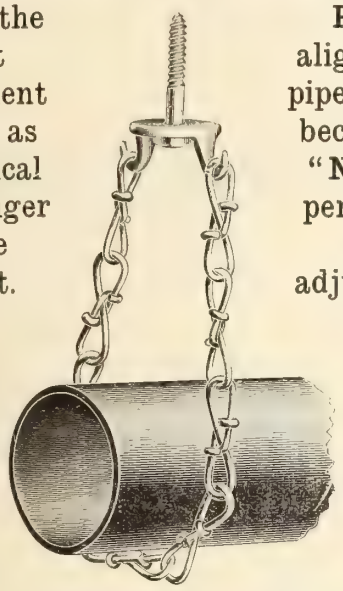
Write us to-day.
Do not delay for to-morrow.

Acme Brass Works

CLEVELAND, O.

NIAGARA CHAIN
FOR
PIPE HANGING

Makes the most convenient as well as economical Pipe Hanger on the Market.



Perfect alignment of pipes assured because the "Niagara" permits of exact adjustment.

Write for samples and prices

Oneida Community, Ltd.

Niagara Falls, Ont.

When You Think of
BRONZE POWDER
Think of Us.

Plumbers and Steamfitters know the value of fine powder that can be **depended on** at **all** times. Our powder cannot be **duplicated,** either in quality or price.

Thousands of satisfied customers all over Canada.

Bronze Liquids are all on the same plane, too. None on the market **like ours.** Try them.

CANADIAN BRONZE POWDER WORKS

MONTREAL - and - TORONTO

No Order too Large. Works at Valleyfield, Que.

D—10245

No Odd Cocks to Haunt You

Plumbers by using the Mueller Interchangeable Right or Left Fuller Basin Cocks will not find themselves with an odd assortment on hand as they do with old style cocks.

The cock is changed by unscrewing a nut and reversing the spout. Invertible Index. Beveled bearing of nut and spout make water tight joint.

We make all other styles of Fuller work.

Unconditionally guaranteed. All users of Mueller goods given Absolute Protection.

Write for prices and literature. Do it now.

TRADE MARK MUELLER REGISTERED

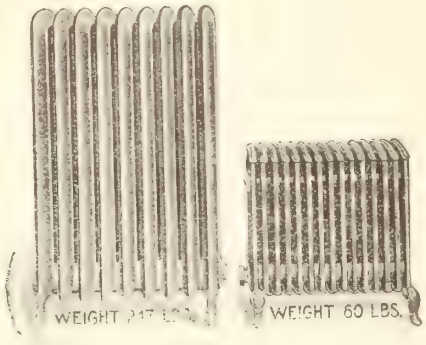
H. MUELLER MFG. CO.

Works and General Office
DECATUR, ILL.
West Cerro Gordo Street

Eastern Division
NEW YORK CITY
254 Canal St., cor. Laf.

Mr. Steamfitter!

Here are Two Pictures. Just Look at the Difference.



If you want to please your customer give him

Kinnear Pressed Steel Radiators

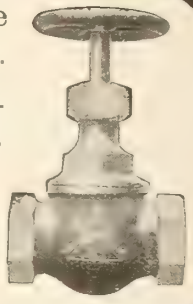
He will like their appearance. Save half the space that cast ones will take up, heat his house in less than half the time. You will save money in freight and men's time handling, and get a reputation of being right up to date. Kinnear Radiators occupy half the space of cast ones, hold 38 per cent. less water, heat in one third the time and heat same amount of space for same number of feet of radiation.

For Further Particulars Write

A. WELCH & SON, 302 Queen West, Toronto

Agents for Ontario

It don't require much argument to convince those who have used our goods of their superiority. They're built for DURABILITY, EFFICIENCY and Effectiveness in Appearance. They stand the test of time.



Everything in **Steam and Water Goods**

For the Engineer, Steamfitter and Hardware Dealer

Our No. 63 Cushion-disc, Low down Compression Basin Cock.

We make a full line of

PLUMBING GOODS *in* Brass and Iron

We handle **Enameled Baths, Lavatories, Sinks, Laundry Tubs, &c.**
Iron and Brass Pipe and Fittings
Pipe Cutting to Sketch

The **Jas. Morrison Brass Mfg. Co., Limited**
93-97 Adelaide St. West *TORONTO*

Our No. 7 Self-closing Basin Cock. Suitable for small lavatories.

Let Our Beaver
Do Your Work.

You Don't Have to
Change Dies.

Cuts 1, 1¼, 1½ and 2″
perfect threads, all
with one set of chasers

RAPID WORKER

The Hand Stock that
Starts Easy and
Finishes Easier.

"The New Way."

You Will Find it a
Sure-enough Beaver.

Write for our special 10-day trial offer

You cannot afford to take the time to thread pipe by hand in any other way

Other sizes of Beavers will be born soon—¼ to ¾—2½ to 4—4½ to 8—8 to 12.

Manufactured by

Borden-Canadian Company

166 Adelaide Street West, Toronto

Manufacturers who claim perfection for their wares are aplenty. We let the practical men of Canada—**the men who know**—make all the claims which we print regarding the

"Sovereign" Boiler

They—**the men who know**—declare that the Sovereign Boiler is just as near perfect as human ingenuity can make a boiler, and add that it is the nucleus of as perfect a heating system as ever devised by man.

Remember—practical men—men who know the virtues of **The Sovereign System** and reaped the profits—say so. The inference is plain.

TAYLOR - FORBES COMPANY, Limited

Head Office and Works: GUELPH, ONT.

TORONTO—1088 King St. West. **MONTREAL**—122 Craig St. West.

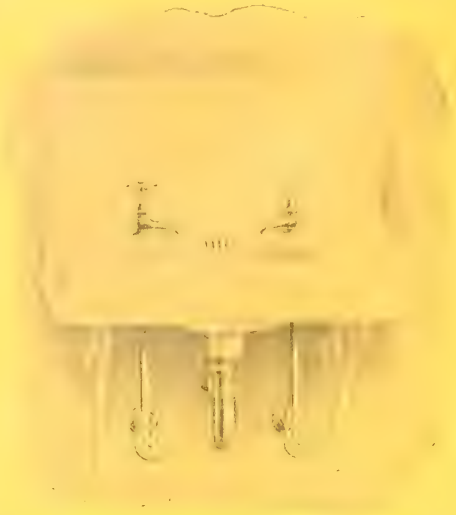
WINNIPEG—The Vulcan Iron Works, Limited

Dealers in Plumbing Equipment Have a Practical Guarantee

of larger profits and greater satisfaction in handling

Standard Ideal Cast Iron Porcelain Enameled Ware

Made in Canada from designs calculated to meet every requirement of the Trade. It is a ware that embodies in itself the durability of iron, combined with the rich white finish derived from perfect porcelain enameling.



PORCELAIN ENAMELED LAVATORY CAST IN ONE PIECE.

Standard Ideal Porcelain Enameled Ware

is of non-porous, one-piece construction, leaving no joins, turns or crevices for dirt, dust or germs to accumulate. It is absolutely sanitary.

We make Bath Tubs, Sitz Baths, Shower Baths, Lavatories, Urinal Ranges, Slop Hoppers, Laundry Tubs, Sinks, Closet Ranges, Steamship Supplies, Railway Car Supplies, Hospital Appliances, Etc.

Write for Catalogue.

The Standard Ideal Company LIMITED

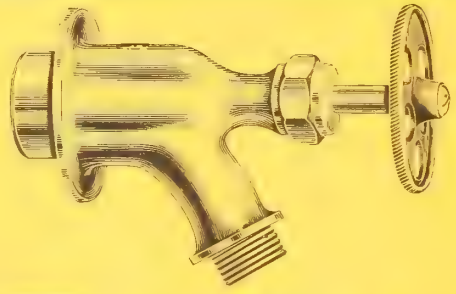
Head Offices and Factories: PORT HOPE, ONT.

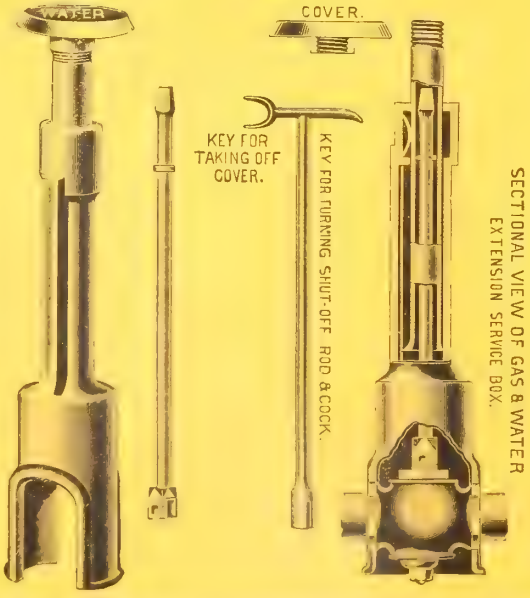
SALES OFFICES AND SAMPLE ROOMS:

TORONTO — 50 Colborne Street

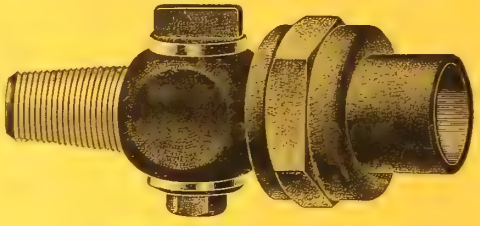
MONTREAL — 128 West Craig Street

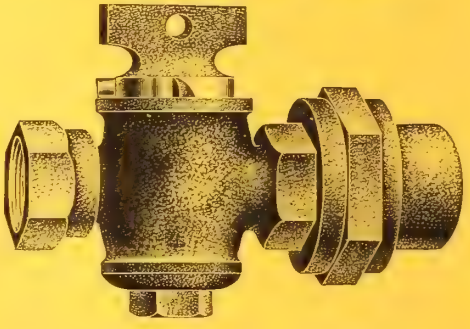
WINNIPEG — 24 Telfer Block





Fittings That Don't Disappoint





For

Plumbing, Water, Gas and Steam

Hays Manufacturing Co.

Complete Works: - - - ERIE, PA., U.S.A.

PLUMBER & STEAMFITTER OF CANADA

THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

MONTREAL 232 McGill St. TORONTO, 10 Front St. E. WINNIPEG, 511 Union Bank Bldg. LONDON, ENG., 88 Fleet St. E.C.

Vol. I. No. 7. (New Series). Publication Office : 10 Front St. East, TORONTO, JULY 10, 1907. Old Series, Vol. XIX. No. 17

Nothing is too good for a good Job

Brass Goods are Important on any Job.

WE HANDLE THE BEST

Prompt Delivery

SOMERVILLE LIMITED

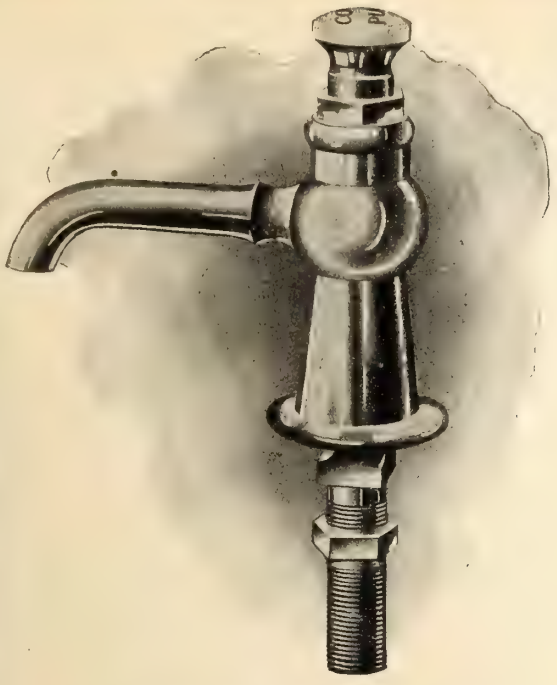
59 Richmond St. East, TORONTO

ROBERTSON'S MARBLE LAVATORIES

In addition to the goods illustrated, we manufacture and carry in stock a full line of staples, such as Brass Compression, Fuller and Ground Work, Soil Pipe and Fittings, Iron Pipe and Fittings, Engineers', Gasfitters', Steamfitters' and Mill Supplies. A Catalogue for each of these departments will be cheerfully forwarded on application.

The James Robertson Company, Limited

265 King Street West, TORONTO



Plumbers' Brass Work

ALL THE

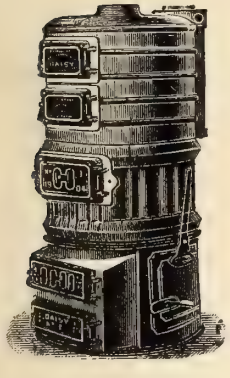
LATEST STYLES

PROMPT DELIVERY

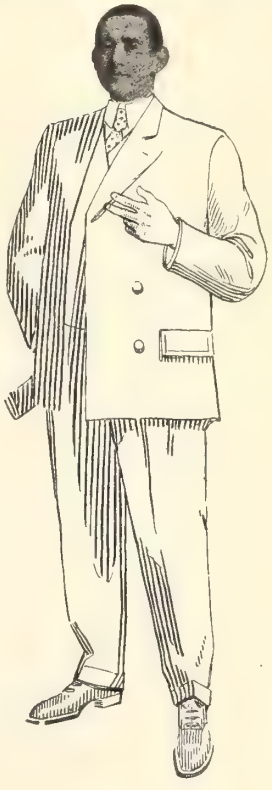
SOMERVILLE LIMITED

59 RICHMOND STREET EAST - TORONTO

Honest Ratings



The ratings of the Daisy Boiler are thoroughly honest and conservative. Every size has been carefully tested and its power accurately estimated, so that in figuring, the steamfitter is positive in gauging boiler capacity according to the published ratings. You will not be obliged to take out a Daisy.



Write for Catalogue.

CLUFF BROTHERS

Lombard Street, TORONTO

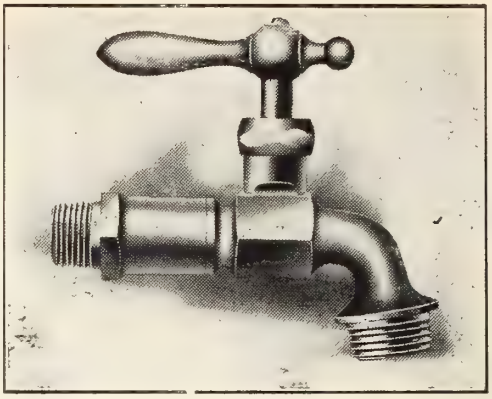
Selling Agents for WARDEN KING & SON, Limited

Monarch is "King."

The Only Way

to retain a good connection
is to make good goods.

That's the reason why we have so many repeat orders.



Once tried, always used, because we "test and try" before you buy.

A full line of Plumbers' Brass Goods, Quick Opening Valves, etc.

Prompt attention.
Perfect satisfaction.
Prices moderate.
Pleased customers.

MAIL ORDERS SOLICITED

Monarch Brass Manufacturing Co., Limited

Factory:
Port Colborne, - Ont.

Office and Warehouse:
278 Dundas St., - Toronto

"Standard" Fixtures Give Permanent Satisfaction

"Standard" Plate B507

"Standard" Porcelain Enameled "Lenox" Design Lavatory with Slab, Apron, Bowl and Overflow all in one piece. Porcelain Enameled Brackets, Nickel-plated Waste Plug, Rubber Stopper, Chain Stay and Chain, Low Pattern Compression Faucets with China Indexes, Supply Pipes, and "P" Trap with Waste and Vent to Wall.

When an architect's client finds that **"Standard"** Porcelain Enameled Fixtures have been specified for his property he is pleased, because he has been taught by actual experiences to regard **"Standard"** Fixtures as the most beautiful, the most sanitary and the most satisfactory equipment that he can secure. The Architect, on the other hand, knows that his customer has the right impression of **"Standard"** fixtures and that the test of use will increase his satisfaction.

Standard Sanitary Mfg. Co.
PITTSBURGH, PA.

NOTICE

To the Trade:

The time has arrived when it is necessary for us to call attention to the fact that our Plumbing Specialties are being copied and imitated by other manufacturers in Canada.

Some manufacturers do not confine themselves to goods of their own invention, but absolutely steal ideas originated by others, which have cost a great deal of time and energy to produce; and since it is true that some have copied goods of our make and are endeavoring to market them,---we refer particularly to our Traps, Vent Caps, Ball Cocks, Fittings, etc., etc.,--we take this opportunity to notify the trade in general that we will immediately take steps to protect our interests. While we dislike to bring our customers, in fact any of the trade, into the controversy, we may be compelled to do so in order to prove sales and get the proper protection we should have under the patent laws of Canada.

The misson of this letter is to notify the trade of our intention in regard to protecting our interests.

The Ideal Manufacturing Company

Windsor, Canada **Detroit, Mich.**

Modern Conveniences for Farm Homes

The Second of a Series of Articles Intended to Help Canadian Plumbers in Educating Residents in Country Districts to the Necessity of Better Sanitary Arrangements.

By Elmina T. Wilson, C.E.

Selecting Location of House.

In selecting a location for a house there are certain points that should be held in mind. A slight elevation, having proper surface drainage, with protecting hills or woods on the north, is greatly preferable to a narrow valley, a low meadow, or the north side of a hill. The house should face so as to get sunlight into all the rooms, if possible, for "where sunlight does not enter the doctor must." This may be accomplished by facing the house southeast, for example, instead of directly east or south.

After the selection of the site some study should be given to the character of the sudsoil, the principal factors to be considered in this connection being the water and the air. There is a certain amount of moisture in the upper layer of the soil which is the cause of damp and unhealthy foundations. This dampness is derived mostly from the surface water, and is directly proportioned to the absorptive power of the soil and can be diminished by tiling and trenching. The ground air is rendered impure by the gases arising from the decomposition and putrefaction that are constantly going on in the soil, especially in that which is contaminated by household wastes.

In the construction of the cellar the first thing is to provide such drainage as will draw off the water at least one foot lower than the surface of the cellar floor and prevent the ground air from passing through the walls and floors. In building the cellar walls every joint should be entirely filled with mortar. A good coat of asphalt over the outside of the wall turned in at the grade line with a course of slate or blue-stone above ground level will prevent all soaking up of moisture. If a draintile is laid just outside the footing course and the space on the outside of the wall is filled with sand and gravel all the way up to grade, the surface water will be carried away through the drain.

The floor of the cellar is best made by a layer of brick or of cinder concrete, covered by a layer of asphalt and finished by a 4-inch layer of stone concrete. A layer of well-beaten clay makes a good cellar floor, but it cannot be so easily kept clean. The height of the cellar walls above the ground is important. They should extend a sufficient distance above the ground to admit of windows in the cellar at least two feet high. This will insure plenty of light and thorough ventilation. There should be cellar windows on all sides of the house.

Laying Out Plumbing System.

There is a great difference of opinion among those who have made special study of sanitary plumbing concerning many of the details of construction and design, but the vital things to be kept in mind when laying out the system are to use the best material, isolate all plumbing, and concentrate as much as possible. By "best material" is not meant the most expensive, but the most durable. Secure simplicity in all needed fixtures. Avoid complications in waste pipes. Select sinks without grease traps, bath tubs without inaccessible overflows, wash basins free as possible from fouling places, and water-closets without valves, connecting rods, or machinery.

The drainage system must be so constructed as to carry away completely, automatically, and immediately everything that may be delivered into it. It should be constantly and generally vented, frequently and thoroughly flushed,

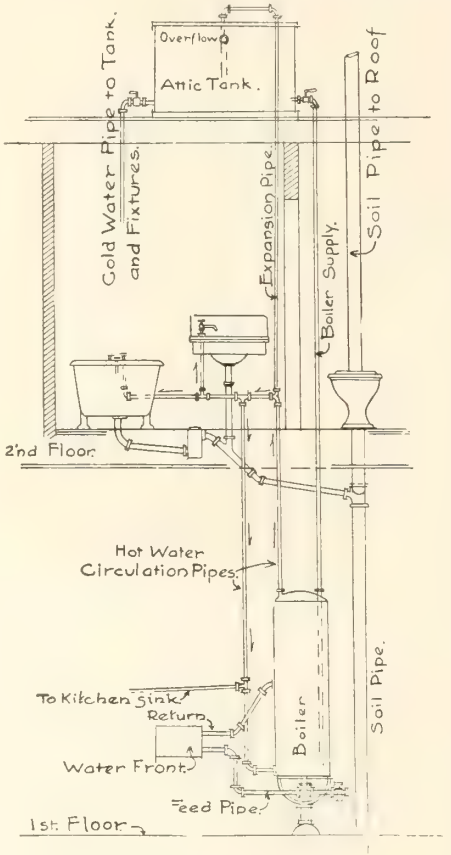


Fig. 2—Hot Water Circulation.

and have each of its openings into the house securely guarded from the entrance of air from the interior of the drain or pipe into the room. All drains, soil pipe, and waste pipe should be absolutely tight against the leakage of water or air.

The main line of the house drainage system begins at the sewer, flush tank, or septic tank, as the case may be, passes through the house by such a course as may be indicated by a judicious compromise between directness and convenience, past the location of the highest fixture that is to discharge into it, and then through the roof for free ventilation. If possible, have the fixtures which are located on different floors in a direct line one above the other to avoid any considerable horizontal run. If bathrooms or water-closets are required in different parts of the house let each have its own vertical line of soil pipe. All plumbing fixtures on bedroom floors should be confined to bathrooms, and under no conditions should there be a wash basin or any other opening into any channel which is connected with the drainage system in a sleeping room or in a closet opening into a sleeping room. Each bathroom should have exterior location and at least one window for light and ventilation, but pipes should not be placed against outer walls unless adequately protected against frost. Never have plumbing out of sight; let each pipe be in full view, and each closet, bath, or basin be unhidden by any sort of inclosing woodwork. There is quite as much danger from the dirt which is apt to gather around concealed pipes and beneath inclosed sinks, bowls, or closets as there is from the admission of sewer gas. The simplest way to prevent the accumulation of dirt is to make it easier to be clean than to be dirty. Therefore keep the plumbing fixtures where there is plenty of light.

Improvements for the Kitchen.

The kitchen is a most important part of the house. On it depends the physical life, and to a large degree the spiritual life, of the family. Realizing its importance, sufficient time and thought should be given to it to secure the best results possible from the material at hand.

Perfect ventilation is the first requirement of a kitchen, light comes next, and in turn the possibilities of perfect cleanliness. The walls should be painted so that they may be wiped off with a damp cloth, making cleanliness possible without great demand on strength, and without the disarrangement caused by white-washing and kalsomining. In these days of enameled paint the walls and shelves of all kitchen closets should be painted. Painted shelves can be wiped off with a damp cloth every day if need be. Paper in kitchen closets is always a bid for dust and vermin.

Hard wood makes the best kitchen floors, Linoleum or oilcloth are labor-saving and, if cut to exactly fit the floor and all joints cemented, are perfectly sanitary. Intelligence does not countenance a carpet on the kitchen floor.

Whatever fuel is used, let the range be one of the best in the market. This is true economy. Near the range and under the same ventilating hood should stand the oil or gasoline stove. There is an infinite variety of these stoves, all economical, cleanly, and safe if managed with care.

A hood suspended over the kitchen range and connected to a flue in the

chimney will gather all the steam and odors and carry them away.

Laundry Arrangements.

When the kitchen is also used as the family laundry, stationary tubs of enameled iron or of soapstone should adjoin the sink. They should be covered to form a table when not in use, but as confined air near plumbing becomes dangerous the covers should close upon rubber knobs or wooden blocks, so as to leave an air space for ventilation. Nickel-plated union strips and hardwood wringer holders should be added between the tubs and at the right-hand end so that a wringer may be used. One of the needs of an ordinary farmhouse is a suitable place for the workmen to wash as they come from the fields. When a separate room is fitted up as a laundry, provision should be made here for the men by adding a large sink and bench.

The kitchen sink should be of cast iron, plain, galvanized or enameled, broad, and of a generous size, preferably with a high back to protect the wall from the water which is certain to splash when drawn rapidly from the pipes. The faucets should be set well up and back to avoid the breakage of dishes by striking them against the faucets. The waste pipe should be covered with a fairly fine brass strainer, which should be held securely in place by screws. At one end should be placed a long draining shelf, the shelf should be well grooved and inclined slightly toward the sink. Both tubs and sink should be well trapt, but as grease traps when neglected are filthy things, and as proper care of the pipes renders them unnecessary in an ordinary kitchen, they should be avoided. Kitchen and pantry sink drains should be treated frequently to a wash of hot water and ammonia or soda to keep them clear from deposits of grease. Kitchen sinks are used for the discharge of liquids which in their original condition are not offensive, but which after a little retention begin to putrefy, and it is very important to secure the complete removal of all such matter well beyond the limits of the house before putrefaction begins.

Refrigerator drains should never connect directly with the drainage system.

Hot Water Apparatus.

A hot-water supply may be furnished by a special heating apparatus in the cellar, a furnace connection, or, as is usual in small houses, by a boiler and water-front attachment for the range. In figure 2 is shown the boiler, water-front, and pipes for a successful water heating and circulating system. The cold water should always enter the boiler at some distance below the point of entrance of the hot water from the water-front of the range; the greater this distance the better will be the circulation, and the less time it will take to heat a certain amount of water. The kitchen boiler is simply a storage tank to keep a supply of hot water on hand so that it can be drawn when required. The chemical properties of the water often determine whether a copper or galvanized-iron boiler may be used. Certain waters will rust out a galvanized iron boiler in a few years, while a copper boiler, used in its place, would last a lifetime. The hot water stores itself in the upper part of the boiler and is forced out by the cold water entering at the bottom. The upper pipe, or hot water pipe, from the water-front to the boiler must not be allowed to sag but must have as much elevation as possible, and also large-sized elbows should be used, in order that the flow of water will have the least possible friction to contend with. The more elevation we get from the water-front to the boiler the better the water will circulate, but the slightest rise in the pipe will make a satisfactory job. It should be a continuous rise from the range to the boiler. To prevent the pounding of steam in the boiler an expansion pipe should be provided to allow the escape of steam and air bubbles if the water comes from a tank in the attic. This expansion pipe should open over the overflow from the attic tank. When pressure tanks are used the expansion pipe must be omitted. The sediment which is constantly accumulating in the boiler should be blown off through the stopcock for that purpose, found under every boiler.

The range and boiler are set as close together as they can be for the purpose of getting the best results in regard to the heating of the water. The best kind of pipe for connecting them is either copper or brass, $\frac{3}{4}$ or 1 inch in diameter, with fittings of the same material having threaded joints. Lead pipe is too soft for the purpose and will not stand the high temperatures which the water in these connections often reaches. If it is desired to draw hot water from the different faucets throughout the house at the moment the faucet is opened instead of having to wait until all the water in the pipe has been drawn out, it is necessary to have a circulation of the hot water at all times from the boiler to the different fixtures. The hot-water pipe is started from the boiler and carried up, as shown in figure 2, to the highest fixture and then connected. The return pipe connects with each of the lower fixtures, finally ending at the bottom connection of the boiler. Be sure to have some upward slope at all points to the pipe which leads from the boiler to the highest fixture; but it is not necessary that the return have a continuous fall.

WILLIAM GREIG, MONTREAL
For 47 Years a Salesman for the James Robertson Company.

A VETERAN TRAVELER.

On the twentieth of June last William Greig completed the forty seventh year of his connection with the James Robertson Company, manufacturers of plumbing supplies, Montreal.

Mr. Greig is a native of Montreal. His business career was commenced in 1857, when he entered the employ of James Walker & Co. In 1860 he became connected with the Canada Lead Pipe Works Company, now the James Robertson Company, and has been in their continuous employ ever since. During that time he has managed their branch at St. John, N.B., and looked after their interests in the Maritime Provinces, and of late years has been representing them in Quebec City and eastern Ontario.

THE TRAVELER'S SMILE.

The traveling man away from home is subject to so many petty annoyances that, were it not for a well spring of good nature, would make him a chronic grumbler. We see him waiting in dingy, dirty, uncomfortable depots for trains that are hours late; and he makes the best of it with a few pleasantries, and sees the bright side of life when the train finally does come in. He reaches hotels after meals are over, and has to go hungry until the next meal or the next day, as the case may be, unless he can get a bite in some country eating place where indigestibles are the stock in trade. He is apt to find a good hotel with a nice bed, clean linen, and every accommodation for his comfort; and he is also apt to find himself in a hotel where the accommodations are miserable, and the prices charged are extortionate. And he may kick; and sometimes he does kick, but more often he makes a quiet mental note to give the house of poor accommodations as little of his patronage as he possibly can, and to arrange his route to give as much of his time as he can to the house that studies his comfort.

The average traveler who goes out to sell goods finds it necessary to "wear that smile," for the grump man cannot sell goods. It is the pleasant fellow, who sees the bright side of life, that makes a success of the business. And the pleasant fellow on the road is not a Dr. Jekyll and Mr. Hyde. He carries his smile into the hotel, and into the store of his customers. He has a cheery word for the hotel clerk, also for the waitress, and the bell boy, and his fellow travelers, and for every one about him.

TO GLUE ASBESTOS TO IRON.

Silicate of soda glue is probably the best substance to use for the purpose named. Brush the glue on the back of the fireplace and then stick on the asbestos fibre, using the asbestos freely. This glue will withstand the heat and hold the asbestos firmly in place.

PLUMBER AND STEAMFITTER
OF CANADA

The MacLean Publishing Co.
Limited

JOHN BAYNE MacLEAN - - - President
W. L. EDMONDS - - - Vice-President
H. T. HUNTER - - - Business Manager
WESTON WRIGLEY - - - Managing Editor

Publishers of Trade Newspapers which circulate in the Provinces of British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, Nova Scotia, New Brunswick, P. E. Island and Newfoundland

OFFICES

MONTREAL - - - - - - 232 McGill Street
Telephone Main 1525
TORONTO - - - - - - 10 Front Street East
Telephones Main 2701 and 2702
WINNIPEG - - - - 511 Union Bank Building
Telephone 3726
LONDON, ENG. - - - - - 88 Fleet Street, E.C.
J. Meredith McKim
Telephone, Central 12960

BRANCHES

CHICAGO, ILL. - - - - - 1001 Teutonic Bldg.
J. Roland Kay
PARIS, FRANCE - Agence Havas, 8 Place de la Bourse
MANCHESTER, ENG. - - - - 92 Market Street
ZURICH, SWITZERLAND - - - - Louis Wolf
Orell Fussli & Co.

Subscription, Canada and United States, $1 00
Published Twice Every Month

Cable Address { Adscript, London
Adscript, Canada

ASSOCIATION OFFICERS.

National Association of Master Plumbers, Steam and Hot Water Fitters of Canada :

Past President—A. J. Hammond, Winnipeg.
President—F. G. Johnson, Ottawa.
Vice-President—John Watson, Montreal.
Secretary—John A. Gordon, Montreal.
Treasurer—H. Mahoney, Guelph.

Provincial Vice-Presidents :—
Ontario—Ben Noble, London.
Quebec—Joseph Lamarche, Montreal.
Nova Scotia—G. A. Wooten, Halifax.
New Brunswick—D. Shea, Fredericton.
Manitoba—C. E. Gate, Winnipeg.
Alberta and Saskatchewan—E. J. Young, Calgary.
British Columbia—Bert Weeks, Vancouver.

Standing Committee Chairmen :—
Legislation—Hugh Wallace, Hamilton.
Apprenticeship—E. H. Russell, London.
Sanitary—H. A. Knox, Ottawa.
Essay—A. J. Hammond, Winnipeg.

The Annual Convention of the National Association will be held on August 21, 22 and 23, in the Plumbers' Hall, 90 St. James street, Montreal. Representatives from all parts of Canada will be present and a full attendance of the trade is important.

EXHIBITION OF STUDENTS' WORK.

From June 11 to 20 an exhibition of work executed by the students of the classes under the Council of Arts and Manufactures of the Province of Quebec was held in the Monument National at Montreal, and was a great success. This is interesting to readers of this paper because of the examples of work shown executed by the students of the plumbing and heating class, and also because this class forms the only means whereby the principles of plumbing work are taught in Quebec Province.

In this class, which forms but a part of the work of the council, 132 pupils were registered for the past winter's work, and an average attendance of 99 was maintained throughout the whole long session, which shows how much the instruction was appreciated. The class met two evenings each week in a hall provided by the city of Montreal, and any person over fifteen years of age was eligible as a student, instruction being given in both French and English languages. It is the aim of the council to make the instruction as practical as possible, particularly for apprentices and artisans, and to this end very practical men are employed as instructors. The results of the season's work were well shown at the exhibition, where very many fine examples of lead-wiping, pipe turning, etc., were shown.

The Master Plumbers' Association of Montreal take an active interest in the work of this class, by the visitation of members, by suggestions, and this past year in a very practical manner by providing the four prizes given as a result of the examinations held—the first prize being a handsome kit of tools. F. Budd, J. Duhamel and O. Labranche were the instructors during the past session, and carried on the work by lectures and practical instruction on the bench; the examination at the end of the session being both oral and practical. Certain it is that the classes are of great value and both the council, the teachers and the students are to be congratulated on the result.

It is to be hoped that some means may be devised whereby the good work may very largely be extended through this country, for the value of this instruction to the young is incalculable.

WATERWORKS CONVENTION.

Two interesting papers reproduced in this issue, entitled "Contamination of Well Water" and "The Action of Water on Lead and Zinc," were read by Dr. W. P. Mason before the convention of the American Waterworks Association in Toronto last month. Both contain much of interest to readers of The Plumber and Steamfitter, and others will be reproduced in future issues if space permits.

The Waterworks Association convention was very largely attended by engineers and others engaged in developing and improving the water systems of our towns and cities. Their work is important and similar in nature to that taken up by the Master Plumbers' Association throughout America.

Men engaged in work of a technical character need trade organizations as much as merchants or workmen, and they need the benefits of association with men engaged in the same class of work. Plumbers and steamfitters, particularly, need organization, not only for the educational benefits, but also because in their capacity of merchants their work is peculiarly subject to price-cutting, the results of which are bound to be injurious not only to the contractor, but to the person who pays for cheap sanitary or heating work.

COMBINE CASES RE-OPENED.

Chief Justice Mulock has found P. McMichael, of the Dominion Radiator Company, Toronto, guilty in the long-drawn-out combine charges in connection with the Plumbers' Supply Association. A fine of $250 and costs was imposed, or in default of payment imprisonment for three months. The costs are understood to total about $2,600.

Mr. McMichael is found guilty on four counts, as follows : Limiting facilities for supplying steamfitters' and plumbers' supplies, restraining and injuring trade in supplying such articles, lessening the manufacture of supplies, and lessening competition in the trade. Along with Mr. McMichael were arraigned L. Payette, A. D. McArthur, R. J. Cluff, H. P. Bush, H. W. Anthes, W. V. Shaw, C. J. Brittain, T. H. Paterson, W. H. Carrick and Edward Gurney. A. A. McMichael, Toronto, and John Minhinnick, London, who were also included, have died since the case was tried in February, 1906.

On their arraignment all pleaded not guilty, and Peter McMichael's case was proceeded with before Chief Justice Mulock, on the 14th of March, judgment being reserved, to await the result of the appeal to the Court of Appeal, who, by 3 to 2, confirmed the conviction against the Central Supply Association, Chief Justice Mulock's judgment disposes of what was for all practical cases a test case against the individual members.

Opinions differ as to the probable action of the principals in the remaining cases. While some may pay the fine and avoid further trouble, others refuse to admit that they have done anything outside the law and say they will not pay any fine. This position seems to be reasonable, as the actions of the manufacturers and supply men in meeting together and arranging selling prices on their goods is no more criminal than the actions of thousands of merchants, lawyers, doctors, or workmen who agree upon prices on the articles or labor they sell. It seems futile, however, for plumbers to bring this view before the courts, and those who decide to pay the fine will escape heavy costs and the option of going to jail.

PLUMBERS ADVERTISING.

Attention is drawn to the action of two large Canadian firms in offering to help plumbing and heating firms to use advertising space effectively in their local newspapers.

Cluff Bros., Toronto, recently under-

took to supply a series of sample advertisements to the buyers of their steam fitters' supplies, and now the Standard Ideal Company, Port Hope, has taken up the same work from the plumbing standpoint. No doubt other supply houses will also give assistance where requested. The Standard Sanitary Manufacturing Company, Pittsburg, has for years conducted this work as a branch of their advertising department.

Canadian plumbing and heating contractors should not hesitate to use the advertising columns of the local newspaper. In these days farmers and suburban residents want, and are willing to pay for, the most modern plumbing and heating equipment. Judicious advertising, helped by the use of the engravings, etc., supplied by manufacturers and jobbers, ought to pay good returns on any reasonable investment made.

U.S. NATIONAL MASTER PLUMBERS' CONVENTION

Some Side Lights from the Convention at Louisville on June 25 to 27, 1907, from our contemporaries. "Domestic Engineering" and "Plumbers' Trade Journal."

T. A. Hill, New York City, is the new president, and T. S. Cochrane, Jr., New York, the new secretary of the National Association.

It was just twenty-four years ago that the National Association of Master Plumbers was created. This silver convention and anniversary of a memorable event was surely fittingly celebrated at this time. Every detail of arrangement was in unison with the occasion. Many charter members of the organization, by their presence lent a touch of interest to the scene. The remarkable progress of the plumbing trade and the vast improvements made in sanitary fixtures during the last quarter of a century were interestingly spoken of by the veterans of the association in attendance at this time. From a comparatively meagre beginning the National Association of Master Plumbers has steadily grown until its influence is now felt throughout this broad land.

* * *

A unique system for the proper ascertaining of credentials was innovated by the National Association this year. Each delegate was presented with six coupons which, after being signed by the delegate in whose favor they were issued, were presented to the sergeant-at-arms on his admission at each session. These coupons were stamped and handed to the national secretary on the adjournment of each session, and in this way a report was handed to each local or state association as to which delegates did or did not attend the sessions. This plan was devised to meet the wishes of the associations that want to ascertain whether or not their delegates attend all meetings of the convention.

* * *

The year has been marked with substantial, if not remarkable progress. Our net gain in membership, based on the June 1 Red Book, is 332, making a total of 8,754; the greatest gain in any one state being Illinois, where under the active and aggressive management of Mr. W. C. Haviland, its permanent secretary, the work of organization is constantly kept up. Illinois increased her membership by the addition of 150 members, and twelve new locals

* * *

A disturbing element has been and will continue to be the unjust and un-American demands of our journeyman labor. To meet this condition in a wise, firm and businesslike manner is a task yet in its infancy. I believe it is an issue that should be treated locally and should not be permitted to endanger our educational and protective works.

* * *

"In this convention we are rounding out the first quarter century of a national existence. From that earnest and able coterie of men who met in New York City in 1883 to organize a national association "who builded better than they knew," we have grown to be an army of craftsmen. In the development we have but reached young manhood. Our founders have grown gray in the service, or are sleeping the last sleep of the faithful. We have here a heritage. The battle is still on, although our ears are not excited by the sound of martial music. It is a peaceful strife, in which victory is to the wise, the sober, the cool head and the clear brain."

* * *

The annual report of the Legislative committee, now submitted through its chairman, John E. Dugan, of Albany, proved a most exhaustive and vitally interesting document. A detailed report of the diversity of plumbing conditions existing in various states showed the great need of good sanitary legislation in many sections—some of which have no laws for the governing of plumbing work or for the proper examining and licensing of journeymen or employing plumbers. Through motion the report was received and spread on the minutes of the convention and the recommendations contained therein were ordered to be taken up by the incoming executive committee.

* * *

The report of the committee on standardization of threads reviewed the work of its members during the last year. They recommended that the work of this committee be continued and that a conference be arranged by it with a similar committee from the manufacturers and a report of their proceedings and action be presented at the next annual convention. Through motion this report was received but the recommendations therein were not concurred in.

* * *

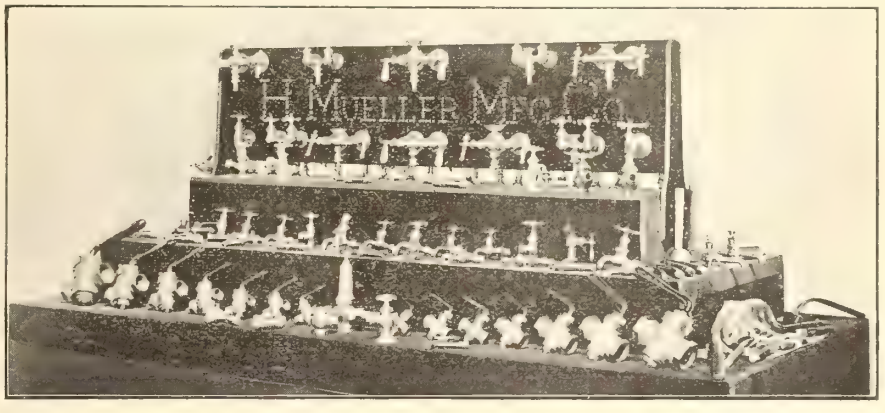
A communication was read from F. G. Johnson, president of the National Master Plumbers' Association of Canada, in which he reviewed the progress of his organization during the past year. Save for occasional strikes the association is apparently in a most healthy condition and the members are now working harmoniously with one another. He extended the cordial felicitations of his fellow colleagues, who, he said, joined him in extending their good wishes for a successful and profitable convention.

* * *

Did you see Adonis Fred Mueller? Of course you did—or if you didn't you heard the noise of his raiment or felt the higher temperature in his vicinity. His white wing collar and double-breasted sable necktie rested on a great white flag of truce framed in a "dream city gray" suit. The Mueller smile, the Mueller moustachois, and a natty white bonnet produced a good effect skyward, while his pedal extremities were concealed in snow-white Oxfords, tied in white silk ribbon and permitting just a fleeting glance of the immaculate silk hose above.

* * *

The H. Mueller Manufacturing Company, Decatur, Ill., had a remarkably complete and effective exhibit at the Seelbach, in charge of Philip Mueller, general superintendent of the company; Fred. Mueller, vice-president, and D. E. Rowley, Louisville representative of the company. The goods on display included the well-known Mueller line of plumbers' brass goods, tools and tapping machines. The company distributed useful souvenirs to the men, in the shape of nickel-plated pliers, and playing cards to the ladies.



The Mueller Mfg. Co's Display of Brass Goods at the National Master Plumbers' Convention at Louisville, Kentucky.

* * *

Several delegates were enticed into an automobile at a late hour Wednesday night and returned to their cots at the Seelbach with an inspiring experience to their credit.

* * *

An artistically molded monk's head, designed as a plaque or paper weight and made of pure red brass, was the handsome remembrance distributed this year with the compliments of the Glauber Brass Manufacturing Company, of Cleveland, Ohio.

Steam Heating in Practice

Article III. — Heating a Business Block and Concert Hall.

Written for this paper by W. B. Mackay, Toronto.

The accompanying plans graphically describe the steam heating of a business block, containing six stores and a concert hall, with other minor apartments, such as would be found in any fair-sized town. On the plans are marked all the information necessary to execute the installation of this heating plant.

It will be seen that the building fronts on a street running north and south, on the west side, facing to the east. The construction is of brick and in good condition.

Requirements of Different Stores.

One of the points to be observed from this example is the different requirements of different stores. There is the dry goods store on the north side of this building, having two sides exposed, to the north and east, respectively, with about 13,000 cubic feet of contents. For this store, one square foot of radiation for 80 cubic feet of contents would be required to give 65 degrees (which is the normal temperature) with the thermometer standing at zero outside..

The grocery store, which has the same cubical contents, glass surface, etc., as the dry goods store, requires slightly less radiation because the directions of the exposures are south and east and the inside temperature need not be raised to the same degree as the dry goods store. Sixty degrees in the coldest weather would be sufficient for this store—one square foot for every ninety cubic feet will be a proper amount.

In the case of the drug store, requiring to be heated to 70 degrees, one square foot for every 85 cubic feet would be sufficient to maintain the desired temperature at zero outside in a store of this or similar exposure.

A temperature of 65 degrees in the haberdashery and cigar stores would be about normal. Accordingly, one square foot for every 90 cubic feet would be required for zero temperature outside. The remaining store is used as a fruit store, and only a small amount of heat is required on account of the perishable nature of fruit. One square foot for every 120 cubic feet would be a proper proportion and would give about 55 degrees in ordinary winter weather.

Heating the Auditorium.

The amount of radiation required to heat the auditorium of the concert hall over these stores will be proportionately large on account of the large amount of glass surface, exposed wall surface, and roof surface, as well as on account of the fact that this hall is only used at intervals and only required to be heated on such occasions.

To the amount of radiation required to offset the loss by the glass surface, wall surface, and cubic contents of the hall, there must be added about 20 per cent. to make allowance for the directions of the exposures and the roof surface. This, then, would complete the estimating of the radiation for this hall provided the heating is to be continued constantly day after day throughout the full time that heating would be required. As such is not the case, this amount would require to be supplemented by about 25 to 30 per cent. more radiation. The reason for this is plain. The walls, etc., of rooms become chilled when they are left unheated and so require extra radiation to re-saturate them with any degree of rapidity.

This auditorium has about 106,000 cubic feet of contents and would require about 840 square feet of radiation, sufficient to raise the temperature to about

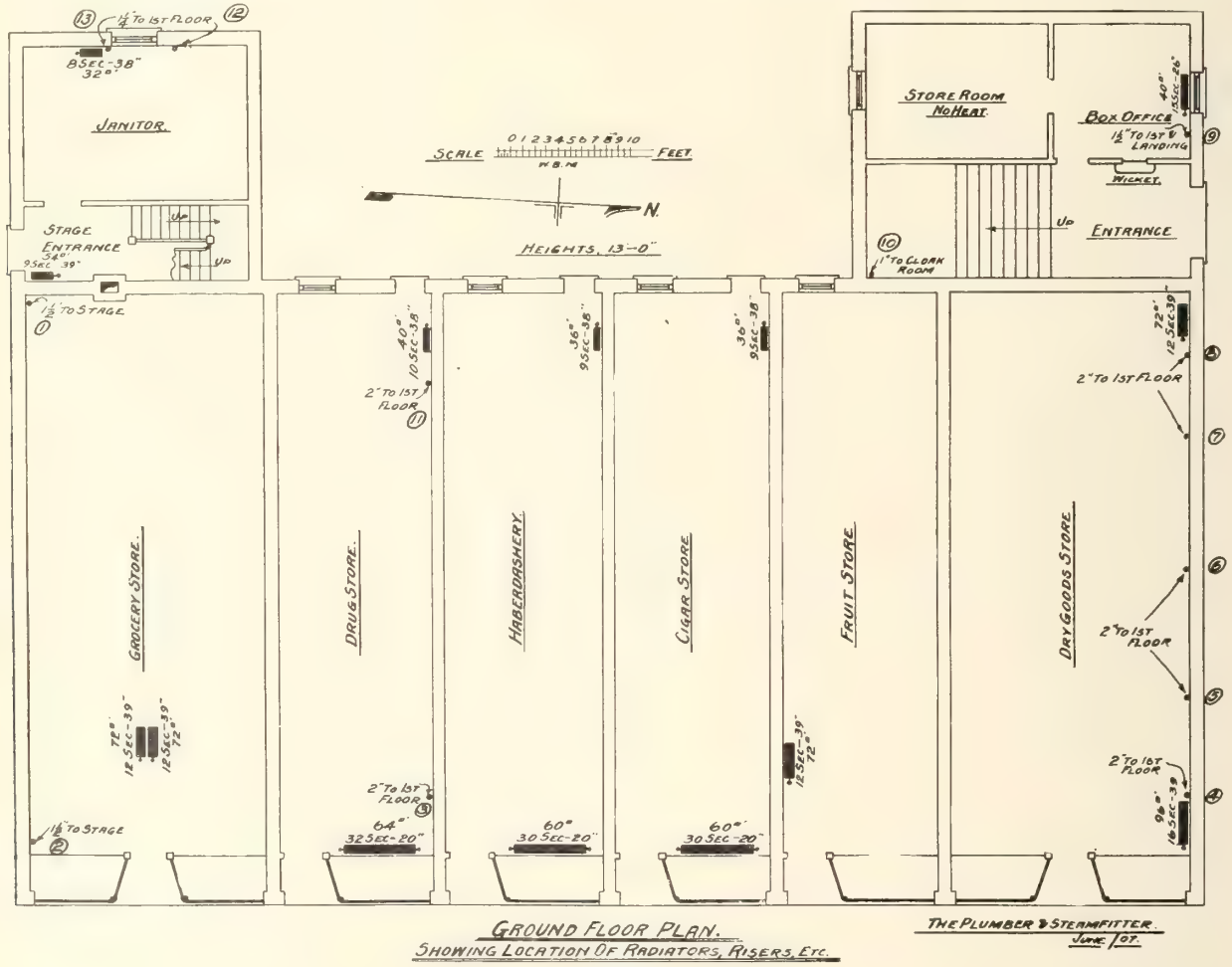
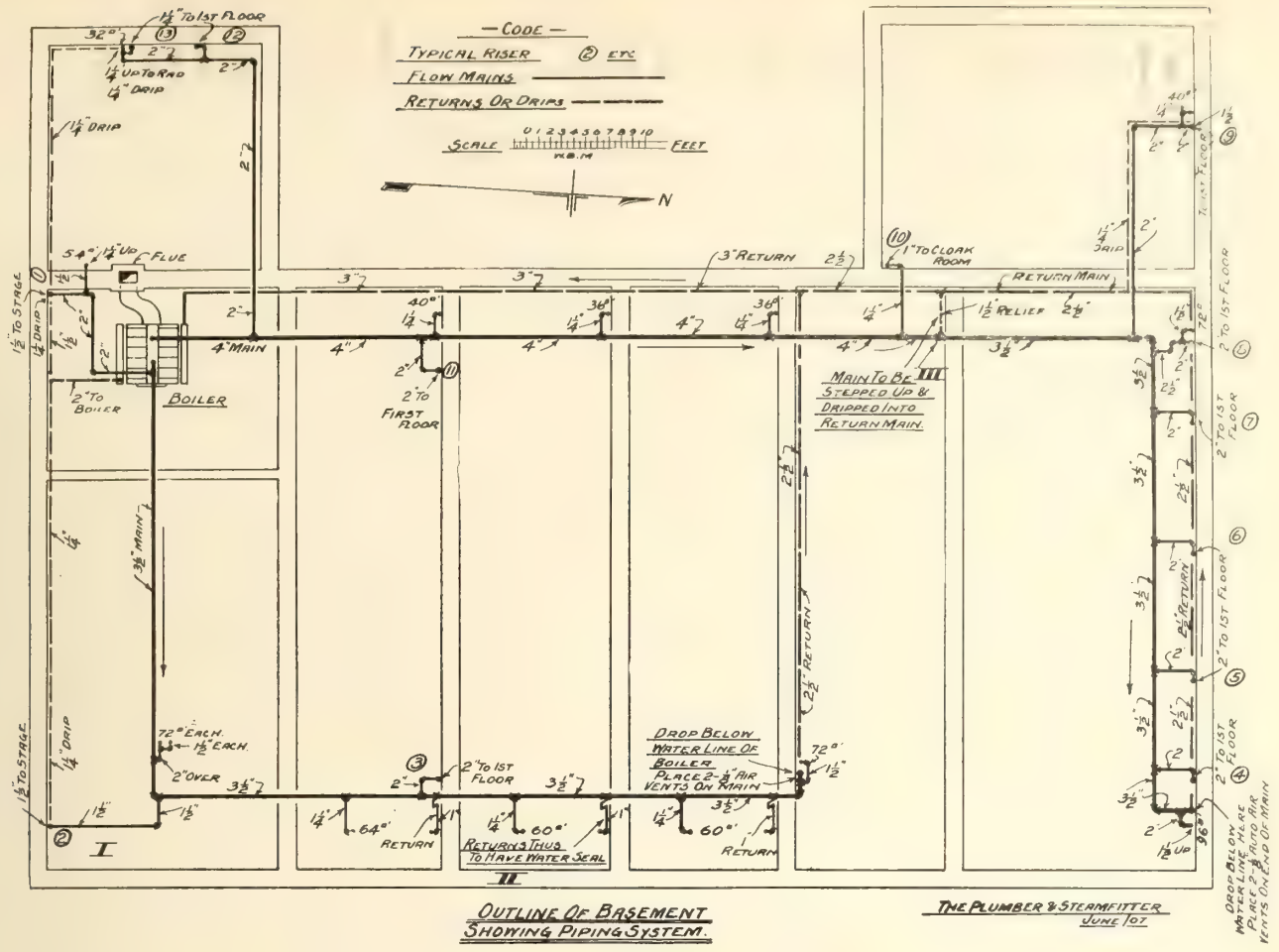


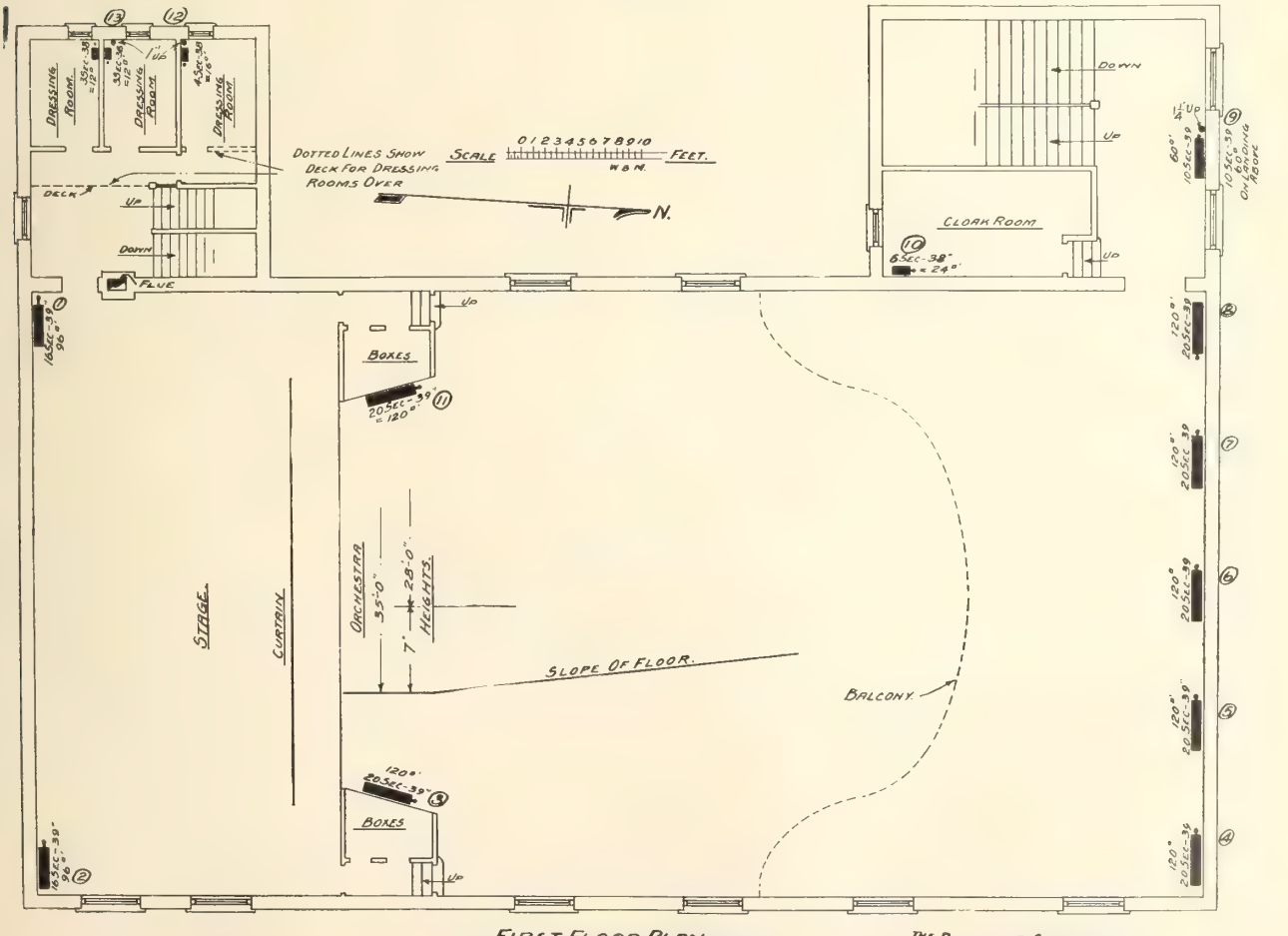
Fig. 1.



OUTLINE OF BASEMENT SHOWING PIPING SYSTEM.

THE PLUMBER & STEAMFITTER JUNE 1907

Fig. 2.

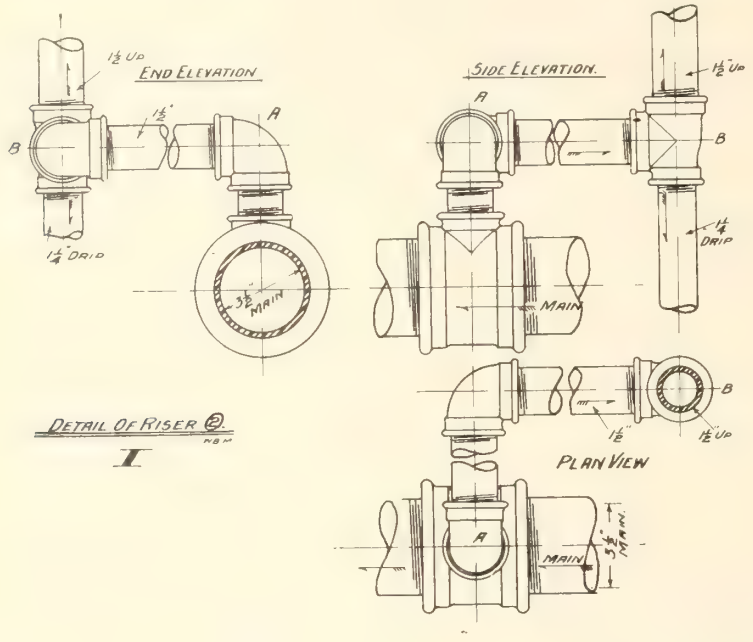


FIRST FLOOR PLAN SHOWING LOCATION OF RADIATORS ETC.

THE PLUMBER & STEAMFITTER. JUNE 1907

Fig. 3.

60 degrees zero weather, the ratio amounting to one square foot for 125 cubic feet. The greater part of the radiation will not be required when an audience of people is seated in the auditorium, because considerable heat is given off by the human body. Therefore at the beginning of performances it will be found necessary to close off some of the radiators, while, if the attendance is large, it may be required to completely shut the heat off the room.

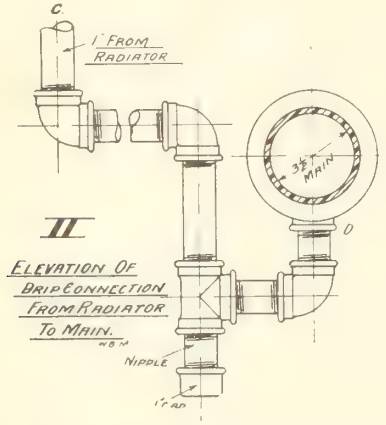


DETAIL OF RISER ②
I

Irregulate Heating.

Churches, lodge rooms, etc., heated intermittently, should be considered in the same manner as this auditorium to provide for their proper heating.

Such a room as the "janitor's room" need only be heated to a sufficient degree to prevent the destruction of anything by frost. The room never being occupied for any length of time is another reason why a low percentage of radiation was figured.



II
ELEVATION OF DRIP CONNECTION FROM RADIATOR TO MAIN.

The box office should be well heated; persons standing at a wicket, manipulating money and tickets, have very little chance to move around to help circulate the blood in the body, so require to be in comfortable surroundings. About one square foot to every 45 cubic feet of contents will be found to be sufficient in a case of this kind. One square foot to 35 cubic feet of contents will be required for each of the dressing rooms, they being of small cubic contents and requiring to be well heated.

The question of heating halls is rather difficult to set down in rules of thumb. The experience and good judgment of the designer counts for a good deal more than any set rule. In these cases it is desirable to prevent drafts, so one square foot to every 60 cubic feet of contents would be a proper amount. This proportion in all probability would not be satisfactory in many other cases unless the conditions were very much similar to these halls. For the stage part of the concert hall, slightly more radiation in proportion will be required than was figured for the auditorium.

Apartment	Cubic contents	Required temp.	Outside temp.	Radiation	Proportion.
Dry goods store	13,000	65 deg.	zero	168 deg.	1 sq. ft. to 80 cu.ft
Fruit store	8,500	55 deg.	"	72 deg.	1 " 120 "
Cigar store	8,500	65 deg.	"	96 deg.	1 " 90 "
Haberdashery	8,500	65 deg.	"	96 deg.	1 " 90 "
Drug store	8,500	70 deg.	"	104 deg.	1 " 85 "
Grocery store	13,000	65 deg.	"	144 deg.	1 " 90 "
Box office	1,600	70 deg.	"	40 deg.	1 " 40 "
Janitor's room	3,200	50 deg.	"	32 deg.	1 " 100 "
Stage entrance	.....	.....	"	54 deg.	
		First Floor.			
Auditorium	106,000	65 deg.	"	840 deg.	1 " 125 "
Stage	.....	.....	"	182 deg.	1 " 100 "
Dressing room, each	.....	.....	"	12 deg.	1 " 35 "

Table Showing Radiation Required.

The results of the computations are enumerated in the following table and show the cubical contents of each apartment, the amount of radiation required to maintain a certain temperature at zero also showing the ratio of the radiation to the cubic contents.

Radiators should be so placed, to efficiently heat the room, as not to destroy anything perishable, and in such a manner as not to obstruct any of the furnishings of the room.

The grocery store is a very good example. The refrigerator is at the rear of the store, consequently a radiator should not be placed in that vicinity. Then, again, as in most grocery stores, canned goods are arrayed on shelving along each side, so that radiators must be kept away from the side walls. The alternative is to place the radiators as indicated on the plan, side by side with a marble slab over them. This arrangement is neat and effective.

In the case of the auditorium on account of the narrow aisles down each side it was necessary to distribute the radiators as shown on the plan, these being the only available places for them. All the other instances cited in this example show the usual location to the best advantage.

The Piping System.

The basement plan gives a graphical description of the way the mains and branches are carried from the boiler to supply the radiators in this building. It will be noticed that none of the mains are reduced to any appreciable extent in size until all branches feeding radiators have been taken off.

This feature about the design of any system of piping in low pressure steam heating has advantages as stated in the preceding article. There will be less drop in the pressure between the boiler and the furthermost end of the main than would be the case if the main was reduced in size at intervals as the branches were taken off. This should be remembered about steam heating as regards the size of the mains to use, especially in the one-pipe system, that at a point in the main close to the boiler there is nothing other than the volume of steam required to feed the radiators on that particular main, whereas at a point farther on in the same main there is condensation that has been returned from the radiators by branches feeding them. It is necessary to provide room for this condensation, and the condensation being cooler than the steam, has a cooling effect and it will be found necessary to deliver a larger volume of steam to the farthest points than is required in the vicinity of the boiler.

It is also essential that the piping be put together with fittings that do not obstruct the flow of the condensation and thereby cause traps in which water will lodge, having a bad effect on the working of the main. Water hammer is sometimes the result of traps becoming filled with water which has such a cooling effect on the steam as to cause a vacuum in that part of the main, giving rise to disagreeable noises.

Some Features of Piping.

At the point marked "III." on the piping plan of the example, there is indicated an arrangement of the piping by which the main is stepped up and the condensation led into the return. This provides not only for a drier main from

this point on to the end, but also for the elevating of the main so as not to obstruct the headroom in the cellar. Fig. III., an elevation view, explains graphically how this connection is made.

Fig. I. illustrates the type of connection used, where long branches from the main to the head of a riser or radiator stub occur. "A" being the highest point in the horizontal run of pipe provides for any condensation flowing down towards "B" with the flow of steam, and drops into the return drip together with the condensation that would occur in the radiators attached to this branch. If the branch was a short one, the elevation given the horizontal pipe would be in the opposite direction so as to provide for the condensation returning back to main, via the same pipe, "A B" which would be the regular one-pipe connection, there being no separate drip needed.

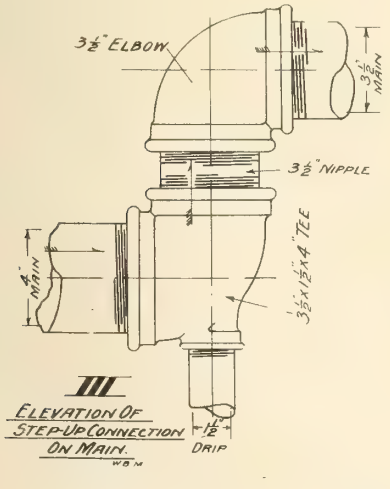
When pipe coils are used it is necessary to have a flow and return connection to have an easy working system. The same may be said about long radiators. The reason for dripping these is the same as would be offered for dripping the end of long branches from the main.

To prevent the condensation returning against the flow of the steam, on the one-pipe system the return main may not be available into which to connect the returns from coils or radiators so that an arrangement of the return drip whereby the condensation may be returned to the flow main is necessary. Two methods are shown in Figs. II. and IV.

Fig. II. is one that is sometimes suggested, but it is as expensive as connecting up a radiator, so that if a radiator is long, it would be just as cheap to have two radiators connected separately and be doubly sure of the working at the same time.

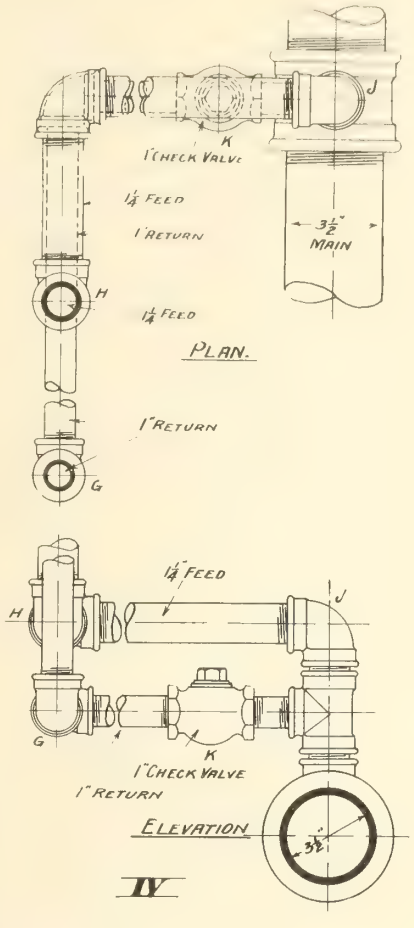
Fig. IV. will be found much more satisfactory, there being less expense in connecting up the return drip, and the fact of a check valve being used in place of the regular valve prevents any trouble arising from not operating the flow and return valves properly.

The trap arrangement shown in Fig. I. is to serve the purpose of the check.



To prevent the steam from flowing up the return pipe into the coil or radiator it would be necessary in every case to close the return valve on the radiator first, or the water in this trap would be forced back up into the radiator or coil, whereas in the case of Fig. IV. the checked valve will take the place of the trap and return valve and will be automatic in its operation.

Freeing the main and radiators of the air that lodges in the system is another



important feature in the good working of a job of steam heating. It is necessary to attach to the radiators and to the main at the proper points reliable automatic air vents. Air being heavier than steam, but lighter than water, will pocket between the two; that is, at the place where the steam main enters the wet return by dropping down. It is at this point that the air vents should be attached to the main. Quarter-inch air vents should be used to facilitate the expulsion of the air and make the system steam up quickly. If these are not procurable, use two ⅛-in. air vents, the same as would be attached to radiators.

BOILER MANUFACTURER DEAD.

Arthur G. Booth, secretary-treasurer of the Booth Copper Co., Toronto, died recently.

Mr. Booth was but thirty-eight years of age, and had been ailing for about a year.

Besides his wife and children, his father, Geo. Booth, president of the Booth Copper Co., and two brothers, Walter C. and Clarence H. Booth, survive him; the former is vice-president of the above company and the latter head of the Pressed Steel Bath Co., Detroit, Mich. The late Mr. Booth has had a long and successful business career and was at one time secretary of the Steel Clad Bath Co., Toronto.

LONDON'S BRASS MANUFACTURERS.

A prosperous manufacturing industry at London is the Empire Manufacturing Co., manufacturers and dealers in steamfitters' and plumbers' supplies. It is a little over four years since this company entered in business, but the head of it, T. A. Stevens, previously had a long experience with the old firm of Stevens, Turner & Burns, and later with the Stevens Manufacturing Company. Their trade extends all over the Dominion, they shipping goods from Halifax to Victoria. At present they employ some 125 hands, all of whom are kept constantly at work. So great has been the growth of their business that they have found their premises, on Talbot street, large though they are, entirely too small to meet their requirements, and are now erecting an immense factory and foundry in the east end, right alongside the interswitch, where, in addition to more room, they will have all that could be desired in the way of shipping facilities, the need of which is at present a great handicap to them. The new establishment will be 300x60 feet, the main part of it practically three storeys high, and the foundry portion two storeys. Besides this there will be an addition for office and show room. Mr. Stevens reports that not only is business brisk, but the outlook for continued activity is most promising.

Another concern that is making rapid strides in advance is the Mann Brass Works, on the southwest corner of Pall-Mall and Colborne streets. Though, comparatively speaking, but a short time in business, this firm has built up a trade that covers the Dominion, and is steadily growing. Orders keep pouring in from all quarters, and the half-hundred or so hands are kept constantly busy. At present the Mann firm is making a specialty of a special line of high-grade plumbers' brass goods.

The large building on the corner of Richmond and Bathurst streets, for years occupied by Stevens, Turner and Burns, the Stevens Manufacturing Co., and at present by the Labatt Manufacturing Co., will in future be used as a boot and shoe factory, having been purchased for that purpose by the Cook-Fitzgerald Shoe Co. The Labatt Company will erect a new shop on Bathurst street, for their plumbers' brass and woodenwork business. They have sold their soil pipe business to the Toronto Foundry Company.

U.S. TRADE NOTES.

The Lunkenheimer Company, of Cincinnati, Ohio, will increase its capital from $500,000 to $2,000,000.

A code for regulation plumbing in buildings has after several months' consideration by the city council of Columbus, Ohio, been adopted. There is one section which is the subject of controversy, and that is in reference to the use of a cast iron house drain or a vitrified tile drain from the house to the sewer. The Board of Health insisted on the use of an iron drain, while the plumbers are said to have favored the vitrified tile. While this matter is left optional, the specifications provide for a high-grade of vitrified tile when it is used. Before the code adopted becomes operative it must be signed by the Board of Health.

ACTION OF WATER UPON LEAD AND ZINC

Paper read by Dr. W. P. Mason at the Convention of the American Waterworks Association in Toronto in June.

Reports recording that a water contains so many parts per million of lead, zinc or other metal are common enough, but it is rare to find advance statements of what a water is capable of doing in the way of dissolving metals should opportunity be afforded it of coming in contact with it. In other words, a client who possesses a water supply which is very desirable at its source is seldom informed of the possible damage which may result thereto by reason of its being conveyed through metallic piping.

After the pipes have been laid and the water admitted to them, record is made of the result as to metallic solvency, but little is found in the nature of a prophecy antidating the outlay of capital, which prophecy, had it been uttered in time, might have had material bearing upon the investment. Again, if, as occurs in a few instances, the client be told that the water under examination is capable of acting upon certain metals he is not given the information in such quantitative form as will enable him to make comparisons between it and other waters with reference to this property.

It is well known that all waters do not equally possess the power to attack metals and it is proper to ask that, granting such power exist, how far is its exercise objectionable from a sanitary paint of view, or, to state it differently, what amount of metallic salts in solution may be allowed with safety?

The interesting case is given of "A water from the tail-race of a gold and silver mill which showed the presence of 350 parts of lead, 51 parts of copper and 1,666 parts of arsenic oxide per million of water. This water, which was supposed to have caused the death of a number of cattle, was so highly charged with arsenic that an ordinary drink for man or beast would contain sufficient to kill."

Such a special instance, however, does not come within the limits of the present inquiry.

Lead Poisoning.

Let us consider for a moment the question of "plumbism" or lead poisoning, as it is ordinarily presented under the classification of a water-born disease.

The Massachusetts State Board of Health enumerates the symptoms of lead poisoning as some or all of the following: Anemia, constipation, indigestion, loss of appetite, thirst, metallic taste, abdominal pain, colic, "drop-wrist," blue line at margin of gums, lead in the urine.

(Report of Mass. State Board Health, 1898, XXXIII.)

Dr. Hunter, describing the effects of the epidemic at Pudsey, says: "Anemia and debility were the most common symptoms. Patients nearly always complained that they felt as if they would sink down from weakness, and that the least exertion would make them sweat freely. The majority had the blue gum line so characteristic of lead poisoning. Colic was a common symptom. Paralysis was not common, but there were five or six cases of almost general paralysis and in these cases 'drop-wrist' was included. The amount of lead found in the waters producing these effects varied from .01 to 1 grain or more per imperial gallon. (.143 to 14.3 per million.)"

There is some difference of opinion among the authorities as to the amounts of contained lead required to condemn a water, but all are agreed that even small quantities should be narrowly watched. Thus, the Massachusetts reports note that one-half part per million has caused serious injury. Haines holds that .1 grain per U.S. gallon (1.71 per million) should cause a water to be rejected.

Whitelegge believes that "No water should be used for drinking which contains more than one part of lead per million, any trace, however minute, indicates danger."

To quote Dr. Summerville in his recent paper in "Water": "Lead to the extent of .25 part per million is sufficient to condemn a potable water."

That sundry waters contain enough lead to prevent their acceptance by at least some of the standards above laid down is shown by the fact that a few years ago it was reported that sixty-three (63) cities of Massachusetts possessed public water supply which contained lead in amounts varying from 85.46 to .032 per million. In four of these cities where lead poisoning was pronounced the average amount of the metal present during ordinary day time use was one part or over per million. Occasionally instances of "plumbism" were noticed in other towns and doubtless other mild or unrecognized cases occurred elsewhere.

In the 31st annual report of the London local Government Board, peaty moorland waters are shown to be especially plumbo-solvent, to a degree chiefly governed by the amount of acidity present, and experiments show that such acidity is due, at least in part, to acid-form bacteria residing in the peat.

The London report already quoted is so firm in its belief that the cause of plumbo-solvency has been located that it ventures to rate moorland waters as "safe" if they are neutral to lacmoid and as "dangerous" if they react acid with that indicator. Attention is also called therein to the fact that moorland streams are highest in acidity during wet weather because of drainage from peaty surface sources and less so during periods of no rain on account of their supply at such seasons coming from the flow of springs.

In this connection it may be noted that H. W. Clark observed that carbonic acid in a soft water was the main factor that caused lead to be taken into solution by the waters from Massachusetts.

It is by no means new to distinguish between the "solution" of lead and that "erosion" of the metal which some waters exercise whereby insoluble lead salts are formed with appreciable increase in the turbidity of the water.

Such classification of the action upon lead has been developed by the report of the London Local Government Board with great care.

For our purposes it will suffice to note that "erosion" does not occur in the absence of oxygen, and we are also to remember that from the sanitarian's point of view "erosion" may be fully as objectionable as "solution" if no opportunity for clarification be furnished. In fact, the former may readily be the greater evil of the two, because of its involving the possibility of the ingestion of large quantities of lead salts held in suspension.

Piping water in tubes of galvanized iron is very common, and as zinc is often more easily attacked than lead it is pertinent to ask if it be equally dangerous. So far as our present experience can guide us towards a correct solution of this question, the reply must be a negative one and the following opinions are presented in support of such contention:

In the journal of the German Society of Gas and Water Engineers for 1887, H. Bante collected statistics to show "that the use of galvanized pipes should be in no way detrimental to health." Similar views are entertained by V. Ehumann, director of the water supply of Wurtemburg. According to Thresh, "There is no doubt that waters containing traces of zinc are used continuously for long periods without causing any obvious ill effects. The water supply to a small hospital with which I was connected for some years always contained a trace of zinc, probably never more than half a grain of the carbonate per imperial gallon, but I never observed any indications of its being deleterious, although such effects were looked for."

In the Massachusetts Board of Health report for 1900, page 495, the following table is given showing amounts of zinc in sundry public supplies, the metal having been dissolved from pipes of galvanized iron or brass during ordinary use. The results are averages and are in part per million: West Berlin, 18.46; Milbury, 3.08; Newton, 1.25; Marblehead, 0.85; Grafton, 0.73; Wellesley, 0.68; Fairhaven, 0.52; Lowell, 0.33; Webster, 0.28; Sheffiield, 8.65; Palmer, 2.90; Beverly, 2.71; Fall River, 0.07.

The first of the above, West Berlin, drew its water through four thousand feet of galvanized iron pipes. The quantity of metal dissolved therefrom was certainly large but appears to have produced no evil results. "As far as is known the amount of zinc present in these waters as used is not sufficient to have any effect upon the health of the consumers of the water."

Galvanized Pipe Not Dangerous.

The Massachusetts Board of Health has investigated the question of the presence of zinc in drinking water supplies where galvanized iron pipes are used and, except in case of the use of some ground waters, containing very large amounts of free carbonic acid, which dissolves zinc and many other metals very freely, the amount of zinc found in ordinary water supplies, where galvanized pipes are used, is not sufficient, in the opinion of the board to give anxiety.

In a private letter of more recent date the president of the above mentioned board says: "If there had been any harmful effects of the presence of zinc in the public drinking waters of the state that fact would have undoubtedly been brought to our attention. No statement to this effect has been made, nor has there seemed to this board rea-

son for suspecting serious danger from this source."

As an instance of long continued use of a water containing much zinc, the case of Brisbane, Queensland, should be quoted. In that city rainwater tanks built of galvanized iron are found in all the houses. The water, which is in common use, contains about 17.1 parts per million of zinc, yet no harmful effects have been observed.

In his experience the writer has been unable to trace any evil effects due to the presence of zinc in drinking water, even when the quantity rose as high as 23 parts per million in a water which is in constant use. It might be well to add, that in the particular case just cited, the zinc was derived from a long stretch of galvanized iron pipes and the amount of the metal present was subject to great and frequent fluctuations for reasons that were not apparent.

It must be admitted, however, that, even on the assumption that the presence of zinc is of no sanitary significance, its being there is nevertheless, not desirable, and the probability of a water being able to dissolve it should be determined and reported on.

Methods of Testing.

What can now be said with reference to some convenient and standard method of reporting the possible action of water upon any of the common metals?

The suggestion offered is this: Let the action, whether of solution or erosion, be stated in parts per million, and let it be that of one litre of water acting upon one square decimeter of bright metal for one hour at 15 degrees Centigrade.

The mode of procedure followed by the writer is to submerge a piece of bright sheet metal, one deci-meter square in two liters of water contained in a wide-mouthed bottle. The water is occasionally given a gentle motion and is kept at 15 degrees for one hour, after which time the metal in solution or suspension is determined. One hour is sufficient time to allow of the watching of metallic solvency, and let it be added, the limiting of the time of action to the standard period is important for the reason that the rate of action of the same water is not only variable, but the ratio of the total action during the different lengths of time is not a simple one. Thus, the quantity of metal attacked in ten hours is by no means ten times that acted upon during one hour.

In conclusion, let it be said that although we know in a general way that softness, acidity, dissolved gases and the presence of much chloride or nitrate will tend towards metallic action, while alkalinity and hardness are rated as protective agents, yet it is far better to actually test a water with reference to its behavior towards metals than to attempt any prophecy of its action based upon analytical knowledge of what the water may contain.

CONTAMINATION OF A WELL WATER

Paper read by Dr. W. P. Mason at the Toronto Convention of the American Waterworks Association

The Anti-Tuberculosis Association of Wellingford, Conn., possesses a six-inch well drilled through red sand-rock, to a depth of sixty-six feet and water raised therefrom by windmill was formerly of excellent quality. During the summer of 1904 an electric light plant was erected, which was supplied with power from a gasoline engine. The necessary store of gasoline was contained in a cylindrical tank of riveted steel, three feet in diameter and ten feet long. This tank was buried just under the ground surface at a point 130 feet distant from the well, and two gasoline engines were installed in a power house nearer the well by thirty feet.

About one month after the starting of the engines, a very decided taste and smell of gasoline developed in the water of the well and has continued, although with diminishing intensity, to the present day, nearly three years after its first being observed.

The contour map indicates the relative positions of the well and the gasoline tank, and shows the general slope of the surface towards the well. The dip of the sand-rock is practically in the same direction.

A suit for damages having been inaugurated, I was requested to examine the property and to advise as to the probability of the well being able to recover its purity within a reasonable length of time.

The information furnished me showed that whether from the exhaust of the engines, from a faulty connection, or from a leak in the tank itself, several hundred gallons of gasoline had run on to or into the soil within about 100 feet of the well. My opinion was that the injury done was beyond repair and that the well should be abandoned for drinking purposes. When one bears in mind the minute quantity of kerosene which remains upon the hands after handling a lamp and with what certainty a pitcher of ice-water is caused to taste of the oil if the ice be touched by the hands so soiled, it is easy to appreciate how very far several hundred gallons of gasoline would go towards contaminating a ground water.

The correctness of the opinion as expressed above has been borne out by the persistence of the gasoline taste in the water until the present time.

Of course the day will come when the last trace of oil shall have been washed away, but who would venture to fix the date for its accomplishment?

NEW WATERWORKS SYSTEMS.

The water committee of Montreal is asking for $17,000 to extend the system to Rosemount.

Sherbrooke, Que., will vote on a by-law to raise $200,000 for the purpose of developing water power.

Aylmer, Ont., will vote on bylaws to purchase the waterworks, $50,000, and $60,000 for a sewerage system.

Halifax intends to spend $768,500 on municipal work as follows: Pavements, $75,000; sidewalks, $150,000; improving fire department, $70,000; water extension, $135,000; sewerage, $50,000; school houses, $95,588; street extension and various purposes, $122,500.

The Municipal Construction Co., Regina, has secured the contract for installing a $50,000 waterworks system at Battleford, Sask.

Bridgeburg, Ont., has in contemplation a sewerage system that will cost about $125,000.

The contract for the construction of the waterworks system at Simcoe has been let to T. M. Cullon, of Huntsville.

Work on the $60,000 sewerage system for Silkirk, Man., is under way.

Brandon, Man., has voted $50,000 for a waterworks system, and $150,000 for fire equipment.

A $10,000 extension will be made to the waterworks system at Vancouver.

The waterworks system of Chilliwack, B.C., has been taken over by a company of local men for $34,000.

Wetaskiwin, Alta., has decided upon the construction of water and sewer works.

Fort William will vote on bylaws to raise $94,000 for the extension of telephone, electric light and water systems, divided as follows: Telephone, $36,000; water, $32,000; light, $26,000.

The Winnipeg city council is in favor of adopting the Red River as a source of water supply. It is estimated that 15,000,000 gallons per day is required. In order to give this it is suggested that pipe lines and reservoirs should be supplied suitable for this capacity, but lift pumps, filters, softening plant, etc., which can be added in units, may be provided now of somewhat smaller capacity, so designed as to be capable of ready extension to this limit. The total estimated cost of the necessary work is $1,545,000. The cost of pumping and softening the water is estimated at $40 per million gallons.

City Engineer Kerr, of Ottawa, says that the water supply of the city is inadequate. At present 14,000,000 gallons of water are consumed per day, while the safe working capacity of all the pumps is only 20,000,000 gallons. He says the capacity should be at least 28,000,000 gallons, and in order to secure this recommends the installation of a duplicate set of pumps.

Niagara Falls is to have an improved waterworks system on which $40,000 is to be expended.

Medicine Hat is installing a modern waterworks system. The Roberts Co., of Philadelphia, have the contract for a filtration plant, consisting of two 1,000,000 gallon units. The contract was also let for a huge stand-pipe with capacity of 500,000 gallons. This has already been erected and stands on the highest point of the city. The base elevation of this reservoir is 110 feet above the business part of the city, thus insuring ample pressure for domestic and fire purposes. The tank is 35 feet in diameter and 70 feet high. In connection with the filtration plant a huge basin has to be excavated and lined with cement. When these works are completed Medicine Hat will have one of the best systems in Western Canada. Pure water is assured throughout the year, as the filtration plant is guaranteed to remove 95 per cent. of the impurities.

LAVATORY WASTE AND VENT CONNECTIONS

Good sanitary practice requires in the installation of the lavatory, as well as in other plumbing fixtures, that the outlet pipe from the basin should be of sufficient size to immediately dispose of all waste water passing into it. By this means the fixture is quickly emptied and at the same time the waste pipe is thoroughly flushed.

Various material is employed for carrying off the waste water from lava-

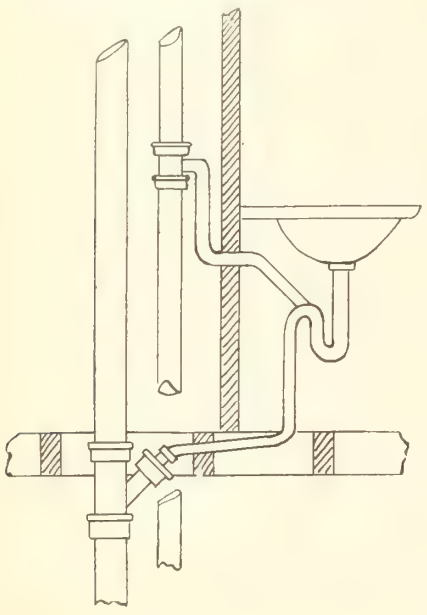


Fig. 1.

tories, such as lead, wrought iron and brass pipe, nickle-plated. Of these, lead is most commonly used and is preferred because of its smooth interior surface which offers a small resistance to the flow of water; in addition to which, it does not easily collect dirt or sediment. Another advantage in the use of lead

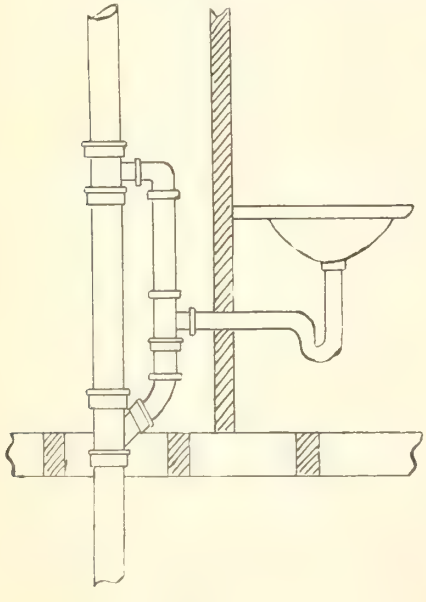


Fig. 2.

pipe is the fact that it can be bent into easy curves. Only heavy drawn lead pipe should be used in good plumbing work.

Nickle-plated brass pipe is largely used for the exposed portions of the connections, while lead is employed for that part beneath the floor or in partitions. The various fittings are also made of brass and finished in a similar manner. The drawback in the use of brass pipe is the cost, which, except in the case of higher grades of work, is prohibitive. The size of the waste pipe leading from a single bowl should not be less than $1\frac{1}{4}$ inches in diameter, while some authorities and plumbing regulations require $1\frac{1}{2}$ inches.

The manner of making the waste connection for single lavatories is clearly shown in Figs. 1 and 2.

Attention is called to the style of trap used on these connections and the mode of venting. In the case of Fig. 2 the vent is taken off at a greater distance from the trap without affecting the trap seal, other than lessening its

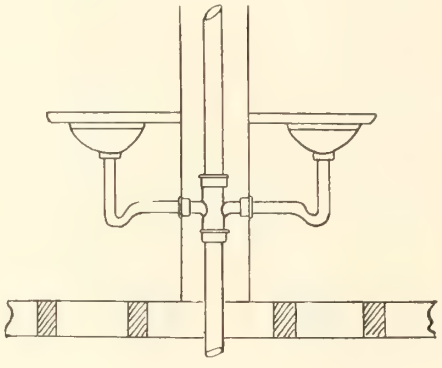


Fig. 3.

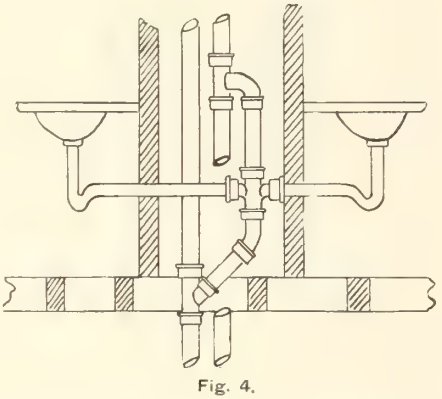


Fig. 4.

rate of evaporation. Another advantage in using the half S-trap is that it can not be as easily siphoned as the full S-trap.

The trap should correspond in size and weight with the waste to which it is attached, and is usually made of lead or brass. Care should be taken to set the trap level in regard to its water seal in order that there may be no danger of lessening or losing the seal. The trap should be placed in as close proximity to the fixture as possible, for the purpose of reducing the length of waste pipe on the house side of the trap, thus avoiding a large amount of material liable to become foul from long use.

Fig. 3 shows the manner of connecting two fixtures located on the same floor on the opposite sides of a partition. This method may be employed provided there are no other fixtures above the floor located on the same stack.

Fig. 4 is an application of what is known as the continuous vent. By the employment of this method of installation the cost of construction is decreased and the evaporation of the trap seal retarded.—Engineering Review.

IMPROVEMENTS IN INDUSTRIAL HYGIENE.

The past decade has witnessed a most remarkable advance in the improvement of working conditions for the operatives in our manufacturing establishments While the manufacturer has, to a great extent, voluntarily introduced such improvements, and has witnessed in their introduction an increase in the efficiency and longevity of his workers, the pressure of the law has, in many cases, been necessary to force him to meet the requirements. Under the direction of factory inspectors much new legislation has been put into effect. Precautions against accident have been taken, machines and elevators have been protected, and ventilating systems have been installed for keeping the air pure and removing objectionable fumes or dust.

Just now exhibitions are being held in various cities, where appliances for safeguarding the person and the health of employes are displayed. Important among the devices for improving atmospheric conditions in crowded, hot, dusty, ill-smelling or badly vitiated work rooms is the fan blower.

Although the blower is very generally installed in connection with a heater as part of a mechanical system of ventilation and heating, local application is usually necessary where the vitiation is excessive—in the metal working trades, for instance, the fan finds a broad field of application.

In the brass foundry hoods may be introduced over the brass furnaces, and ventilation secured with certainty by the introduction of an exhaust fan. This should properly be of the cased or enclosed centrifugal type, the disc or propeller type being only suitable for operating against slighter resistances.

Rattling and tumbling barrels may be rendered innocuous by exhausting through hollow trunnions or from housings built over the tumblers. An exhaust system in connection with the sand blasting room will greatly improve the conditions under which the workman operates.

Probably the greatest need of exhaust ventilation in the metal industry exists in connection with buffing, grinding and polishing processes. The high speed of rotation of the wheel tends to throw the fine particles of dust or lint directly into the atmosphere, which soon becomes surcharged therewith. Each wheel is usually enclosed in an individual hood, rigidly supported, and connecting through an exhaust pipe to a horizontal main laid just behind the grinders and thence to the fan. Each connection is provided with a blast gate.

Try to be content with your lot even if it isn't a corner lot.

PARAGRAPHS OF INTEREST

By C. E. Oldacre, Toronto

Proper Placing of Radiators.

The position or proper and satisfactory placing of the radiators in a piece of hot water or steam heating work is a question requiring attention in every particular.

Of course it is granted that the best place is at the outside wall of a room or otherwise at the coldest portion—this being usually under the window or at one side of the same. At the same time, when it is a question of placing the radiators so the work may be done the most economically, the conditions do not always harmonize with all the wishes of the owner.

For some time it has been the custom to place the radiators of a low type underneath the window, so that the least valuable wall space is taken. But this is coming into somewhat of a disfavor with the ladies of the house, especially those who have had experience with homes heated with hot water or steam direct radiators, as it has been found that the fine, impalpable dust ever present in the air is soon deposited on the lace curtains usually draped at the windows, necessitating their removal and cleansing. This is more pronounced and quicker noticeable with steam than with water heating on account of the more active movement of the air over the surfaces of the steam radiator, due to their higher temperature.

Recesses in Walls.

In some cases the radiators are recessed or partly recessed under the windows, back into the wall. This is noticed as having been done in some cases without properly protecting the wall with suitable strapping or furring. Considerable more heating surface will be required where the radiators are recessed, as the movement of the air of the room is more or less restricted in its movement over the heating surfaces.

The greater the restriction of this movement and the farther radiators are recessed or otherwise excluded from contact with the air of the room the greater will be found the proper proportion of heating surface that will be required to maintain the temperature of the air of the space that is required to be heated. The nearer the radiator becomes an indirect radiator instead of a direct radiator the greater will be the heating surface required in any given case.

Failures Due to Poor Drafts.

A good draft is essential to the proper working of any heating apparatus, whether steam, hot water, or hot air, and many otherwise well installed plants have been condemned and unjustly maligned for no other reason.

Without a good draft, proper combustion cannot take place, and then the consumption of fuel goes on and still the desired results are not attained. Even with an undersized apparatus, where proper combustion can be had very fair and frequently satisfactory results are to be attained, where even with a liberally proportioned apparatus and a poor draft the results in every way will be found unsatisfactory. A good draft is half the battle and is easily checked when the full action of the heating plant is not required.

The Sizes of Boilers.

This brings up another point, whether it is not just as easy to put in a boiler too large for the work as it is one too small. The most extreme demand for heat only comes for a very short period during any one winter season and then only for a few days when the boiler can be pushed, so to speak, to carry the overload. If the boiler is of such a size as to carry the normal load of the winter, according to the prevailing usual winter temperatures it can be much easier adapted to the lighter duties during the milder weather when heat is required, which is the larger portion of the period during which heat is needed in the average home or building. The same is true where boilers or engines are required for power purposes. Taking any given case, the plant is installed for the normal load, and if an overload of not to exceed twenty-five per cent. is to be carried for a short period during the day the plant will easily meet these conditions and be of much better proportions to carry any underload than if it was of such size that was up to the full maximum capacity, all things being considered. Of course, this need not be construed as an argument in favor of too small heating apparatus and boilers in particular, but favoring apparatus that can be most easily adapted to meet all conditions of temperature, be they low or high, as it is to be considered that one extreme is as bad as the other.

Boilers Need Attention.

Heating boilers as a rule receive the poorest kind of attention. Of course there are exceptions to the rule—but in many cases they get attention when the results they produce are really surprising. They are down cellar and out of sight, and out of sight means out of mind.

Too frequently what is considered a good fire is a surface fire only—nice and bright on top and to all intents and purposes presumably a good hot fire, but if it is raked or shaken it will be found that there are hardly enough good live coals left to start a fair fire for quite some time, the greater part of the contents of the fire-box being ashes and cinder. When it is good and cold there is nothing like having a good deep mass of incandescent coal—alive right down to the grate, when results are to be had, and not a thin skim of bright coals on top. A deep fire, good and clear, need not be going at the maximum rate of combustion and still produces the results that a clogged fire-box half full of ashes and cinder, with all the drafts full on, can never produce. It gives much better satisfaction to both the fitter and the user, and brings few complaints.

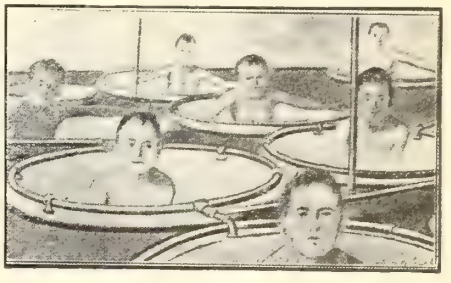
Vent Pipe Connections.

Expansion, or vent pipes, connected to hot water heating systems located in sections of the country that have the extreme weather conditions are much better if not carried through the roof or connected into the soil pipe of the plumbing system, as hoar frost is likely to gather or form in the pipe and completely seal the entire heating system, causing the piping or expansion tank to burst at the most inopportune time. Where such conditions are to be met it is much better that the vent pipe be carried to some sink on the first floor or ground floor or have the pipe carried down to the basement or cellar, thus avoiding expense to the user as well as inconvenience.

BATHING IN SCHOOLS.

In Boras, Sweden, there is said to be a novel idea on the subject of giving a large number of children baths at a minimum of expense and trouble. Popular Mechanics says that a new school building in that town has been built provided with a bathroom containing round enameled tubs sunk in the concrete floor, each large enough for one child. A circular pipe surrounds each tub and is pierced with frequent small openings, and all these pipes are connected with both hot and cold water reservoirs In the bottom of each tub is the outlet and stopper.

With a child in each tub, the water is turned on by an attendant until all



A Novel School Bathroom.

tubs are nearly full. Each tubber is furnished with soap and brush and allowed ten minutes for scrubbing. Then the stoppers are pulled out and each child is given a final shower, beginning at 95 degrees and gradually cooling to 60 degrees. In this way forty-eight children are run through in an hour. After each relay the tubs are washed out thoroughly by the jets of water from the circular rim pipes, reinforced wherever necessary by brushes in the hands of attendants, and ending with a scald of the hottest water. The tubs entirely remove the danger of drowning where large numbers use a swimming tank.

SHIELD FOR HEATING-COILS.

P. S. Knoth, New York, N.Y., has invented a detachable shield for heating-coils such as are used in schools, offices, stores, and other buildings and places. The object of the invention is the provision of a shield arranged for convenient and quick attachment to the coil without requiring any addition or a change in the construction and arrangement of the heating coil.

NEWS OF THE TRADE IN CANADA

F. Boal, plumber, Winnipeg, has assigned to E. Richardson.

Bourne Bros., of Revelstroke, B.C., have moved into larger quarters.

J. N. Benzie, Kamloops, B.C., is to locate his plumbing business in larger quarters.

W. J. Cluff, of Cluff Bros., Toronto, made a business trip to Chicago ten days ago.

R. J. Elliott, one of Kingston's leading plumbers, was a visitor in Toronto last week.

L. A. Payette, of Warden King & Son, Montreal, spent a few days in Toronto last week.

The Lawrence Hardware Co., Revelstoke, B.C., is doing a nice plumbing contract business.

R. J. Cluff, Toronto, has returned from a holiday trip north into the Cobalt and Temigami country.

Moscrop Bros., formerly of Revelstoke, B.C., have purchased the establishment of Kemp Bros., Vancouver.

Pattison & Pfeiffer, Calgary, Alta., hardware merchants and plumbers, have been succeeded by Pfeiffer & Wallace.

Damage was done by fire to the plumbing establishment of Blouin, Desforges & Latourelle, Montreal, on June 17th.

Sam. Brewer, secretary of the Thos. Robertson Co., Montreal, manufacturers of plumbers' supplies, is away on his vacation.

W. H. Carrick, of the Gurney Foundry Company, Toronto, is on a holiday trip inhaling the balmy sea air on the coast of Maine.

William Knight, representing the Amherst Foundry Co., of Amherst, N.S., was calling on the trade in Montreal this week.

The foundry department at the Wallaceburg Brass Works has decided to shut down every Saturday afternoon during the hot weather.

Joseph Gustave Duquette and Francois X. Bissonnette, Montreal, have been registered to carry on a plumbing business under the firm name of F. X. Bissonnette & Co.

The plumbing firm of Crump & Perrier, Halifax, N.S., has dissolved, and Geo. A. Perrier has opened up a new plumbing and stove business at 33 Granville street, Halifax.

The Dominion Radiator Works will build a large chimney in connection with their works in Toronto. The stack will be 125 feet high, contain 25,000 bricks and cost $20,000.

George Garrett, for 19 years with W. J. McGuire & Company, Toronto, has opened a hardware store at 582 College street, Toronto, the firm being known as Garrett & Wainwright.

Roy Spence, invoice clerk for Cluff Bros., Toronto, took a fortnight's holidays last month, and spent them getting acquainted with his bride, the holiday being also a honeymoon.

W. A. Brown, Vancouver, recently completed the installation of fixtures in the Vancouver hotel lavatory, consisting of porcelain urinals, closets and lavatories. These fixtures were imported from England.

Duncan A. Cays, architect, of Kingston, is having a fine brick residence built, the successful tenderers being Taylor & Hamilton for plumbing, steamfitting, gasfitting and metal work.

Mr. Weeks, the senior member of the plumbing firm of Weeks & Son, Vancouver, has retired from active business. The firm are expanding and are erecting a new building for the enlargement of their business.

Paul Smith, sales manager for Cluff Bros., was married a fortnight ago to a Detroit young lady. Mr. Smith was formerly connected with the steamfitting supply house of J. A. Roe, at Detroit, the largest firm of the kind in Michigan.

C. E. Oldacre, of the Gurney Foundry Co., Toronto, has been making a trip through New Ontario and will be one of the delegates in attendance at the convention of the American Society of Heating and Ventilating Engineers, at Milwaukee, on July 18 and 19.

N. A. Lougheed, son of Senator Lougheed, Calgary, who has been on the Gurney Foundry Company, at Toronto, has returned to Calgary, where he will lay out and take charge of the construction of the heating plant of the large residence being erected by his father.

Winnipeg has made an advance by securing powers to put plumbing into houses, charging up the expenses on a seven years' basis, the cost being levied on the property thus improved. The aim is to help people who cannot afford the whole cost at once, to make their houses sanitary.

Jas. Watt & Sons, Chatham, Ont., secured the contract for the steam heating, plumbing, gasfitting and electric wiring of the Union Bank, Leamington. They have also the contract for installing the heating, plumbing, wiring and gasfitting of the new public general hospital addition at Chatham.

Shaw & Mason, brass founders, have prepared plans for a factory to be erected at Sydney, N.S. The floor space will occupy fifteen thousand square feet. Besides the brass foundry there will be an iron foundry and nickel-plating and sheet metal work will be carried on. The machinery will be operated by electricity.

Dr. C. A. Hodgetts, secretary of the Ontario Board of Health, is making arrangements to install at one or two representative cheese factories septic tanks and any other appliances found necessary for the disposal of sewage. They will be used as object lessons to induce cheese manufacturers generally to pay attention to sanitation.

The Standard Plumbing & Heating Co., with headquarters in Winnipeg, are opening a branch of their business in Strathcona. This firm has been established for some time in Edmonton and has executed many of the largest plumbing contracts in that city during the last year. A. F. Meagher will be the manager of the Strathcona business.

F. R. J. MacPherson, Peterboro, has been awarded the contract for the heating in connection with the new $200,000 armories which are being erected there by the Dominion Government. It is understood the price of the contract is in the neighborhood of $45,000. Mr. MacPherson has also been given the contract for the re-heating system to be installed in the Separate school on Lake street. It is a new combined system of heating and ventilating and a Pease furnace will be installed, and will cost about $2,500.

A new business block is about to be erected in Peterboro by the Toronto Savings and Loan Company. It will be three storeys high and will contain room for three single stores and one double. The double store has been rented to Adamson & Dobbin, hardware and plumbing merchants. Their new premises will be 20 feet wide by 100 feet deep and the firm intend fitting them up so that they will have one of the best hardware stores in the province, outside of the larger cities. Two hustling young men constitute the partnership and the business is steadily growing. Adamson & Dobbin do a big store trade and also make a feature of plumbing.

SASKATOON NEWS.

Russell and Barrett are now occupying premises on Twenty-first street and carry a full line of plumbing goods. The front part of the building is used for showing baths, lavatories, sinks, etc., which are laid out to advantage. Here the customer has a good assortment of goods to choose from and can readily make a suitable selection. On the right is an apartment fitted up as an ordinary bathroom, showing tub, closet and lavatory, the whole looking neat and having a pleasing appearance. The remainder of the building is occupied by an office and fitting room, pipe racks and fixtures. This is a branch of the Prince Albert business, and is ably managed by A. Barrett.

* * *

The firm of Wells & Cornish, plumbers and steamfitters, has undergone a change, both as regards name and location. Mr. Wells has sold out his share of the business to Mr. Elford and the new firm will be known as Elford & Cornish. During the last few days they have removed from their old stand on Second avenue to a more desirable building on First avenue, where there is more accommodation for keeping a larger stock.

* * *

G. G. Taylor, who has recently started in the plumbing business, has secured the contract for plumbing a dwelling house for Dr. Croll. He is also working on the heating contract for the new brewery of the Hoeschen-Wentzler Brewing Co.

PLATING ALUMINUM.

A process of plating aluminum with copper by welding methods has been invented in Germany by Herr Wachnitz. This is regarded as important, because one of the obstacles to a wider use of aluminum has been its comparative lack or resistance to the action of many fluids and its failure to hold paint. These objections are removed when it is covered with a thin plating of copper, while its weight is not materially increased.

PLUMBING AND HEATING MARKETS

MONTREAL PLUMBING MARKETS.

Montreal, July 8.—It was stated by a member of a prominent plumbers' supply company that never before has he seen such a large volume of business transacted as at present. All the supply houses are exceptionally busy, and more orders are coming in than can be filled with ease and despatch.

The large amount of building operations now in progress has created a demand previously unparalleled, and all the manufacturers have more orders than they can handle. As the Amherst works are not yet in operation, other factories have to work at their utmost capacity to fill the demand.

Trade conditions are not as satisfactory as might be desired, as owing to price-cutting amongst the jobbers, both in Ontario and Quebec, prices on some lines are necessarily low.

Lead Pipe—Since our last issue an advance has been made in the prices. The present quotations are for lead pipe, 7 cents per pound, net list, and for lead waste, 8 cents per pound, net list.

Iron Pipe—A scarcity still prevails for small sizes from ¼ inch to 2 inches. Manufacturers are very busy filling the large number of orders which are arriving in increasing quantities. They are also experiencing much difficulty in procuring raw material from the Pittsburg district. Owing to this fact prices have again slightly advanced on small sizes. We now quote: Galvanized, ¼ inch, $3.30; ⅜ inch, $3.30; ½ inch, $3.90; ¾ inch, $4.83.

Brass Goods—The demand for these is strong, but supplies are short. Prices are still high, but with a drop in copper it is hoped that brass prices will also decline.

Enamelware—The demand is strong, and supplies are adequate, although the manufacturers are finding it hard to make them so. Prices continue unremuneratively low, owing to price-cutting by keen competitors.

Cast Iron Fttings—Prices remain unchanged with strong demand. We continue to quote a discount of 57½ per cent.

Soil Pipe—A steady demand prevails. We continue to quote: Medium and extra heavy pipe and fittings, up to 6 inch, 60 and 10 to 70 per cent.; 7 and 8 inch pipe, 40 and 5 per cent.; light pipe, 50 per cent.; fittings, 50 and 10 per cent.

Solder—The price for half-and-half guaranteed bar solder is 25 cents per pound, and for wiping, 22 cents.

Metals—Ingot copper is weaker. English dealers are selling low, but American markets are somewhat stronger. No changes have been made in prices. We continue to quote: Lake ingots, $25.50; casting ingot, $23.50. Lead at present is very strong, and the prospects are that it will remain so for some time. Imported pig, per 100 lbs., $5.45; bar, $5.75. Pig iron continues very firm, and in Great Britain warrants are quoted now 6s. higher than last week. Old material is weak, very little business being done at present. Heavy copper and wire, 18 cents; light copper, 16 cents; heavy red brass, 16 cents; heavy yellow brass, 14 cents; light brass, 10½ cents; heavy lead, 4¼ cents; scrap zinc, 4 cents; No. 1 wrought iron, 15½ cents; No. 2, 6 cents.

TORONTO MARKETS.

Toconto, July 9.—Trade continues brisk in all departments of the local plumbing market and the staffs of all the large supply houses are kept busy filling their orders. Business is indirectly affected to a certain degree by the fact that, after nearly a two months' holiday, the plumbers and steamfitters are still out on strike. So far as Toronto is concerned, this tends to reduce large contracts for new work to a minimum, or to cause the commencement of new work to be indefinitely postponed; meanwhile, building operations continue at an unparalleled rate all over the province and supply houses are kept busy attending to this trade.

Iron Pipe—Prices are beginning to show signs of stiffening, owing to the continued scarcity of many sizes, and the difficulty experienced in securing even reasonably prompt deliveries from the mills.

Soil Pipe.—A fair business is being transacted, with supplies quite adequate to meet the demand. The following prices still hold good: Medium and extra heavy pipe and fittings, up to 6-inch, 70 per cent.; 7 and 8-inch pipe, 40 and 5 per cent.; light pipe, 50 per cent.; fittings, 50 and 10 per cent.

Solder and Lead Pipe—The demand for solder is fair, with no change in price. Wiping solder is quoted at 23c. per lb. Lead pipe is in good demand and the price on waste and lead pipe has advanced to net list, instead of five off as formerly.

Compression Work, etc.—The former is still quoted at 57½ per cent. Fuller work is now being quoted at 65 per cent., and apparently price-cutting has ceased. Ground work is quoted all the way from 40 to 50 and 10 off, according to the class of work to be done.

Cast Iron Fittings—A good business is being done in these with prices unaltered and firm at 57½ per cent.

Enamelware—Still in heavy demand, with prices unchanged. Though price-cutting has practically ceased, nevertheless it has left its bad effects, for not a few buyers are showing a disposition to hold back their orders as long as possible in anticipation of further cuts.

Metals—A decline is looked for in the price of copper, but even if this should materialize, an immediate drop in brass work is not expected, as the leading brass manufacturers have all paid high prices for their materials.

STRIKE AT CALGARY.

The forty-four members of the Calgary plumbers' union went out on strike on July 2. The men have been receiving 45 cents an hour, and three months ago they asked for an increase of ten cents an hour on the first of July. The employers could not agree to the demand, but offered 50 cents an hour immediately, 52½ in six months, and 55 in twelve months. This was agreed to by the union.

The principal point now in dispute is the apprenticeship question. The practice has been to allow one apprentice for every three journeymen, and one for every two additional, but the employers claim the right to employ an unlimited number of apprentices.

TORONTO PLUMBERS' STRIKE.

Almost two months have elapsed since the inauguration of the Toronto plumbers' and steamfitters' strike, yet there is not a single indication of an immediate settlement of the difficulty.

The large employing firms claim to have the places of twenty-five per cent. of their former staffs filled by non-union men while the secretary of the union states that fully one hundred and ninety men have been granted permits to go back to work at the union's terms. While the employers contend that the union's policy of issuing permits only serves to weaken the position of the employes by allowing that much more work to be done, on the other hand the union reaps a big financial gain, because these one hundred and ninety men each pay back twenty-five per cent. of their wages to keep up the union's funds. With this help and the weekly allowance from the International Union the officials of the union claim to be able to indefinitely continue the struggle and emphatically deny the statement made by the employers that the union's resources are weakening.

A couple of days ago the employers claimed that the employes were showing signs of weakening and backed this up by the statement that several union men had gone back to work without permits from the union. The secretary of the union expains that such a statement is misleading and that the report originated from the fact that a certain firm succeeded in getting three union men back by giving them an interest in their business.

At the beginning of the strike the empoyers declared their intention to fight for the "open shop" and Secretary Merrick asserts that from that stand the employers will never recede. Meanwhile the employes, as from the first, are open for negotiations, but, thus far, there is no talk of compromise and in all likelihood the fight will continue for some time yet.

NEW PUTTY FOR JOINTS.

A new compound for pipe joints has been introduced in France. It is free from all the inconveniences of red lead. The new putty is composed of zinc gray and a Chinese vegetable oil utilized in England for manufacture of linoleum and some kinds of varnish. The material hardens completely at 150 degrees F., and at 110 degrees C., in six hours. This putty is said to be cheaper than red lead, and is of less density.

Jardine Hand Drills

New Designs

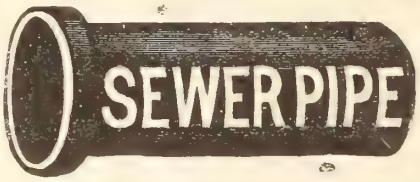
Get samples of these machines for your show room. They will interest your customers and prove a good investment.

It pays to sell the best Tools.

A. B. JARDINE & CO.
HESPELER - - - ONTARIO

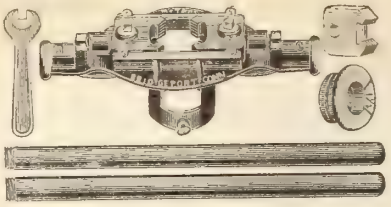
...FULL STOCK...

Salt Glazed Vitrified



Double Strength Culvert Pipe a Specialty.

THE CANADIAN SEWER PIPE CO.
HAMILTON, ONT. TORONTO, ONT.
ST. JOHNS, QUE.



The Armstrong Manufacturing Co.

317 Knowlton St., - Bridgeport, Conn.

Manufacturers of the Genuine Armstrong Stock and Die, Malleable Iron Hinged Vises, Pipe Cutters, Pipe Wrenches, Bard Adjustable Bushings, Ratchet Attachment for Stock, Pipe Threading and Cutting-off Machine--Hand and Power. Our goods are sold by all Jobbers.

CATALOGUE MAILED ON REQUEST

There are reasons for the constant demand for

"Diamond" brand Fittings

The finish is smooth, the threads perfect, the material first-class.

WHOLESALE ONLY

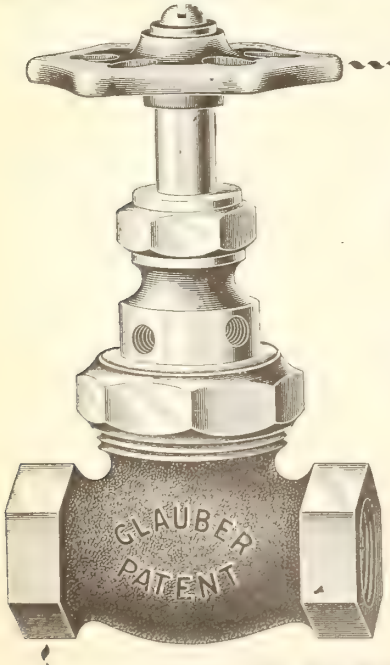
OSHAWA STEAM & GAS FITTINGS CO., LIMITED
OSHAWA, CANADA

No. 30 King. Price, each $5.20 net.

HOTTEST ON EARTH

We manufacture the largest line of mechanical tools using gasoline, kerosene and alcohol as fuel. Your jobber will supply you at factory prices. Guaranteed to please you or money refunded.

THE TURNER BRASS WORKS
53 MICHIGAN STREET, - CHICAGO, U.S.A.



Automatic

SELF DRAINING COMPRESSION

STOP AND WASTE COCK

The Only Self Draining Cock Made

Patent Features, Two holes in bonnet—Upper hole for air—Lower hole for waste—insures perfect circulation and automatic drain, no matter in what position cock is installed.

Interchangeable right or left. Quick operating stem. Made to stand Boiling Water as well as Cold.

GLAUBER FIVE YEAR GUARANTEE PROTECTS YOU

A Trial Dozen Will Make You Order More

CLEVELAND, **GLAUBER BRASS MFG. CO.** OHIO

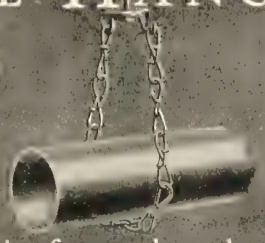
If you can use High-grade Low Down Compression Basin Cocks with China Index Handles, ask for the Acme Brass Works Nos. 4, 5, 6 and 7 Basin Cocks, which are just what you want. They are the acme of perfection in style, workmanship and durability.

Write us to-day.
Do not delay for to-morrow.

Acme Brass Works
CLEVELAND, O.

NIAGARA CHAIN *for* PIPE HANGING

Most convenient and neatest as well as the most economical hanger on the market.



Pipe may be hung any distance from ceiling with this hanger. Permits of easy and exact adjustment.

Write for samples and prices.

ONEIDA COMMUNITY, Ltd.
NIAGARA FALLS, ONTARIO.

Backed by a Guarantee

All our **Bronze** Powders and **Liquids** have the distinction of being **Guaranteed.** All plumbers and steamfitters know the necessity of having the **Best** in Bronze Powders and Liquids.

OURS NEVER FAIL

The Canadian Bronze Powder Works

MONTREAL—TORONTO

No order too large Works at Valleyfield

If your nearest dealer does not keep our goods, write us.

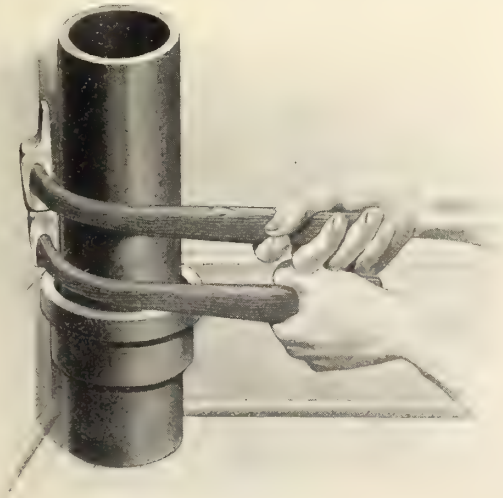
Any Boy who has *One Cent* can Turn it Into *Ten Dollars*

One cent invested in a post card to us will bring you information about how we start you in business, so that you can earn money for yourself. You can make plenty of pocket money all the time—money you will enjoy more because you made it in business for yourself. Hundreds of boys are doing this. SO CAN YOU.

No money required. We furnish capital.

We also give prizes. There is a prize for every boy, whether he lives in a large city or a little village. Very fine prizes have gone to fellows in small places. Don't delay a minute. Write us to-day. A post card will do.

The MacLean Publishing Co., 10 Front Street East, Toronto



Mueller Soil Pipe Calking Tools

With this handy outfit of Right and Left Combined Yarning Iron and Hammer and Combined Calking Iron and Hammer your troubles in calking soil pipe in out of the way places will disappear. With these tools it becomes an easy and simple operation

TO GET INTO THE UNHANDY CORNERS

and do a first-class job. Plumbers who have used this outfit give it unqualified endorsement.

Sold in sets, in pairs or separately and Unconditionally Guaranteed. Write for prices.

TRADE MARK MUELLER REGISTERED

Made of the best tool steel with either bent Hickory handle or steel in one piece.

SPECIFICATIONS

Combined Yarning Iron and Hammer: Point ⅛x¾; wt. Wood handle, 1 lb.; Steel handle, 2⅜ lb. Combined Calking Iron and Hammer: Point, ¼x¾; wt. Wood handle, 1lb.; wt. Steel handle, 2⅜ lb.

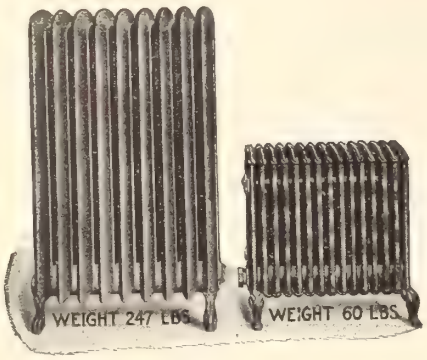
H. MUELLER MFG. CO.

Works and General Office
DECATUR, ILL.
West Cerro Gordo Street

Eastern Division
NEW YORK CITY
254 Canal St., cor. Laf.

Mr. Steamfitter!

Here are Two Pictures. Just Look at the Difference.



If you want to please your customer give him

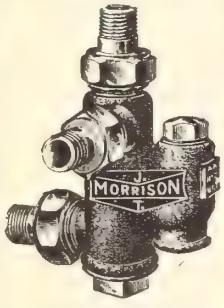
Kinnear Pressed Steel Radiators

He will like their appearance. Save half the space that cast ones will take up, heat his house in less than half the time. You will save money in freight and men's time handling, and get a reputation of being right up to date. Kinnear Radiators occupy half the space of cast ones, hold 38 per cent. less water, heat in one third the time and heat same amount of space for same number of feet of radiation.

For Further Particulars Write

A. WELCH & SON, 302 Queen West, Toronto

Agents for Ontario



J. M. T. Injectors are fully guaranteed to work under the most varied conditions that it is possible for a machine of this type to operate.

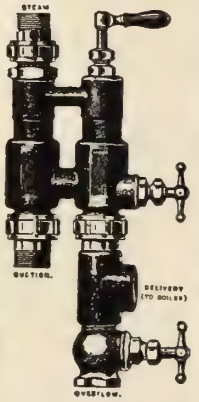
"QUALITY"

Steam Goods

Our lines are fully guaranteed for the uses for which they are made and recommended.

J.M.T. Valves, Injectors and other steam specialties are made for ***Durability*** and ***Efficiency.***

The JAS. MORRISON BRASS MFG. CO., Limited
93-97 Adelaide St. West TORONTO



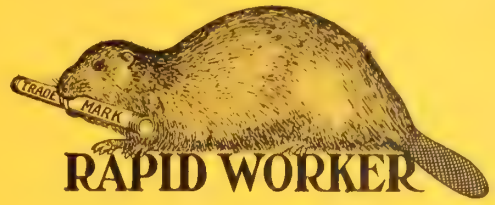
The Genuine Hancock Inspirator, a double tube boiler feeder specially adapted for Stationary and Marine Boilers.

J.M.T. VALVES are standard for "Valve Excellence."

Let Our Beaver Do Your Work.

You Don't Have to Change Dies.

Cuts 1, 1¼, 1½ and 2" perfect threads, all with one set of chasers



RAPID WORKER

The Hand Stock that Starts Easy and Finishes Easier.

"The New Way."

You Will Find it a Sure-enough Beaver.

Write for our special 10-day trial offer

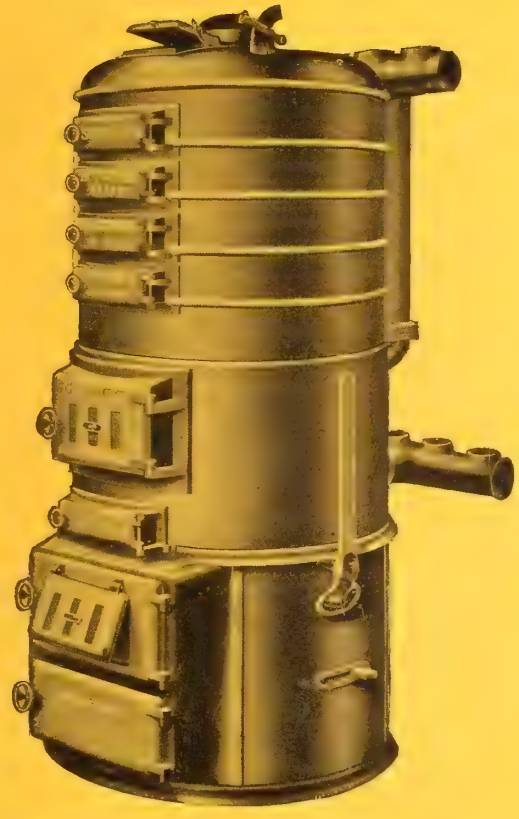
You cannot afford to take the time to thread pipe by hand in any other way

Other sizes of Beavers will be born soon—¼ to ¾—2½ to 4—4½ to 8—8 to 12.

Manufactured by

Borden-Canadian Company

166 Adelaide Street West, Toronto



Manufacturers who claim perfection for their wares are aplenty. We let the practical men of Canada—**the men who know** make all the claims which we print regarding the

"SOVEREIGN" BOILER

They—**the men who know** - declare that the Sovereign Boiler is just as near perfect as human ingenuity can make a boiler, and add that it is the nucleus of as perfect a heating system as ever devised by man.

Remember—practical men—men who know the virtues of **The Sovereign System** and reaped the profits—say so. The inference is plain.

Taylor-Forbes Company,

LIMITED

Head Office and Works: GUELPH, ONT.

TORONTO—1088 King St. West. MONTREAL—122 Craig St. West
WINNIPEG—The Vulcan Iron Works, Limited

Free Advertisement Cuts and Copy for Plumbers

Look below at the sample advertisement of ***Standard Ideal Porcelain Enameled Ware*** and consider if it would help you in your business. We supply plumbers who recognize the merit of ***Standard Ideal Porcelain Enameled Ware*** with advertising CUTS AND COPY FREE.

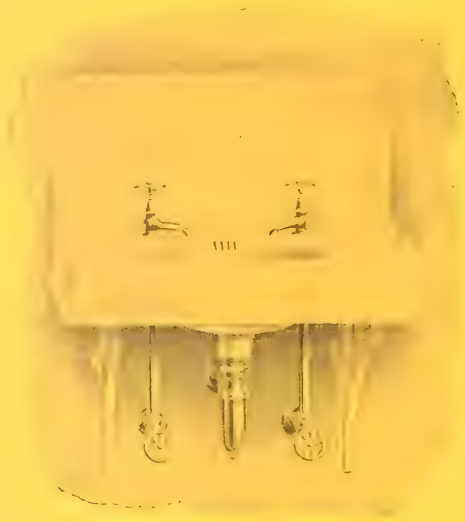
If you like the sample on the right, a word from you to us and we will send you what copy and cuts you want —free.

The Standard Ideal Co., Limited,

Port Hope,

Ont.

Nowhere Does Perfect Work Count More



than in the sanitary equipment of a modern house. Poor plumbing is synonymous with loss of health, loss of comfort, loss of savings, loss of property values.

"STANDARD IDEAL" PORCELAIN ENAMELED WARE

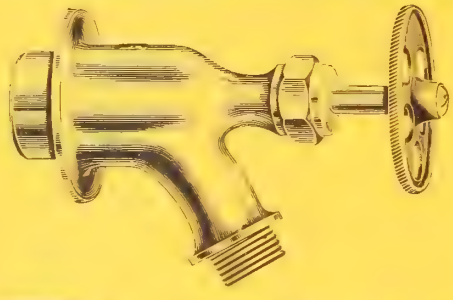
installed in the bedroom, bathroom, kitchen, or laundry guarantees health for the family and adds to the cash value of the home.

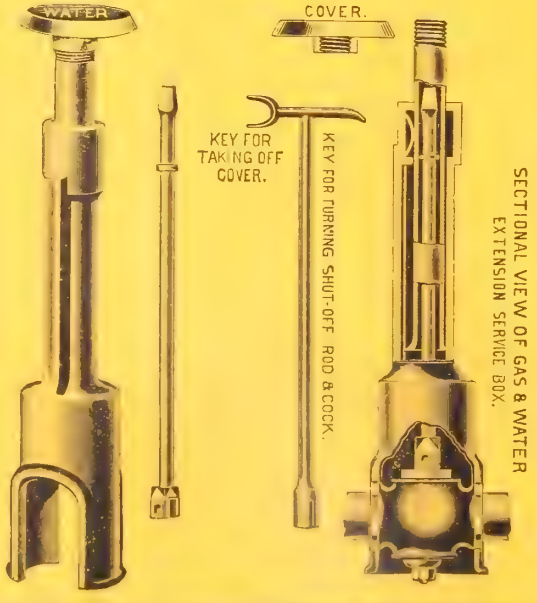
Moderate in first cost, it soon pays for itself and becomes a valuable asset.

Let us instal it in your home.

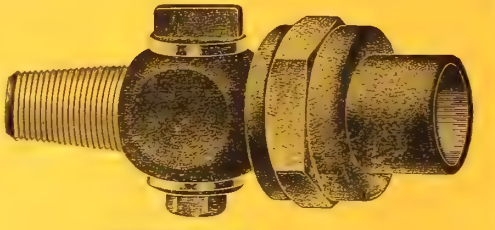
JOHN BLANK & CO.,

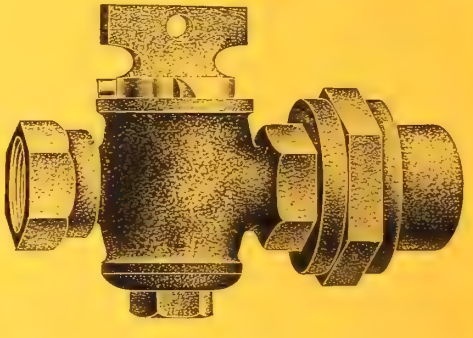
Plumbers and Steamfitters





Fittings That Don't Disappoint





For

Plumbing, Water, Gas and Steam

Hays Manufacturing Co.

Complete Works: - - - ERIE, PA., U.S.A

PLUMBER & STEAMFITTER OF CANADA

THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

MONTREAL, 232 McGill St. TORONTO, 10 Front St. E. WINNIPEG, 511 Union Bank Bldg. LONDON, ENG., 88 Fleet St. E.C.

Vol. I. No. 8. (New Series). Publication Office : 10 Front St. East, TORONTO, JULY 24, 1907. Old Series, Vol. XIX. No. 18

THE DAISY BOILER

After a quarter-of-a-century's experience in the manufacture of Hot Water Boilers, the thousands of homes we have supplied and the reputation we have earned, has satisfied us that our product is undeniably the most popular heater in the Dominion. The steamfitter cannot fail to satisfy his most exacting client.

Daisy

SEVERAL STRONG POINTS

It embodies every feature of simplicity, durability and efficiency.

Every part can be set up with ease and despatch.

The draft arrangement permits of the finest degree of control.

Ample room is provided in a spacious ashpit for the convenient handling of ashes.

Write for catalogue and prices.

Your orders for steamfitters' supplies, whether large or small, will roceive our best attention. We carry in stock every style and variety of fittings, pipe, valves and miscellaneous supplies.

CLUFF BROTHERS

LOMBARD STREET, TORONTO

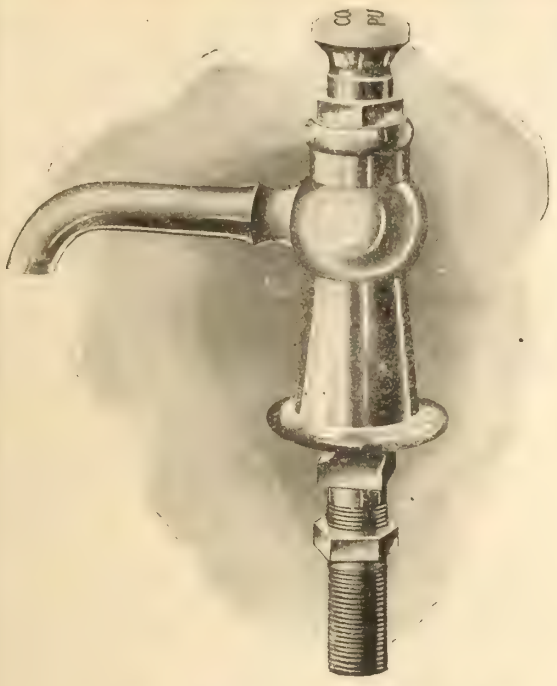
SELLING AGENTS FOR WARDEN KING & SONS, Limited

ROBERTSON'S MARBLE LAVATORIES

In addition to the goods illustrated, we manufacture and carry in stock a full line of staples, such as Brass Compression, Fuller and Ground Work, Soil Pipe and Fittings, Iron Pipe and Fittings, Engineers', Gasfitters', Steamfitters' and Mill Supplies. A Catalogue for each of these departments will be cheerfully forwarded on application.

The James Robertson Company, Limited

265 King Street West, TORONTO



Plumbers' Brass Work

ALL THE

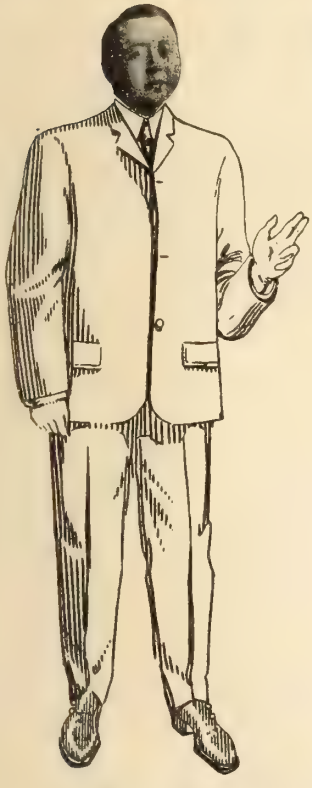
LATEST STYLES

PROMPT DELIVERY

SOMERVILLE LIMITED

59 RICHMOND STREET EAST - TORONTO

Why You Should Sell The Daisy

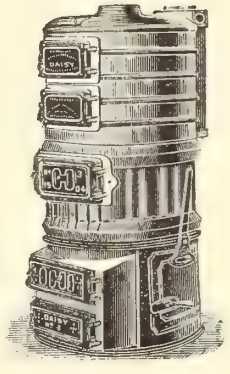


¶ *Because the quality of material used in the manufacture of the Daisy is the best procurable.*

¶ *Because every part is accurately finished and thoroughly tested and you are not required to tear down your work to remove defective parts.*

¶ *Because it is the most self-contained and easily erected boiler on the market.*

¶ *Because once the Daisy is properly installed no further time is required to care for it.*



Write for Catalogue.

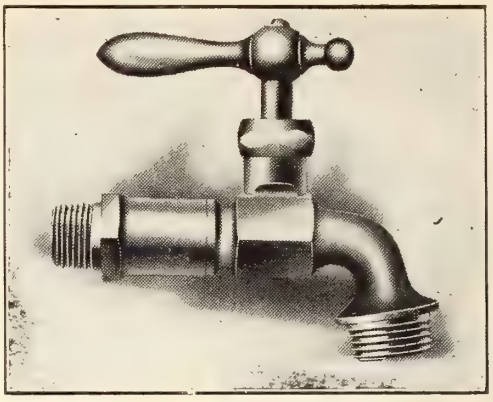
CLUFF BROTHERS

Lombard Street, TORONTO

Selling Agents for WARDEN KING & SON, Limited

Monarch is "King."

It's Our Way We "Test and Try"



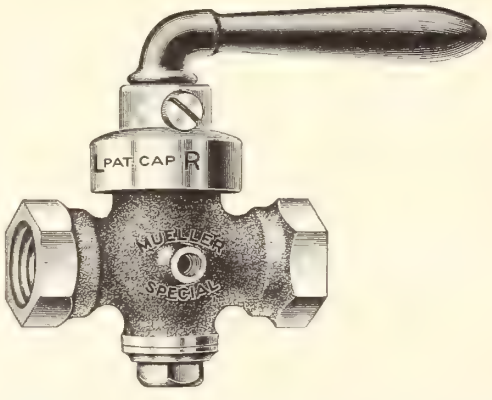
UP-TO-DATE GOODS FOR WIDE AWAKE PLUMBERS

A "Monarch" Cock is faithful to the last.
Users of "Monarch" Goods wear the everlasting smile.
Full line Compression and Fuller Brass Work.

The Monarch Brass Manufacturing Co., Limited

Factory:
Port Colborne, - Ont.

Office and Warehouse:
278 Dundas St., - Toronto



These goods are made in all styles of pipe connection, all sizes and with Emameled Iron Lever Handles or Galvanized Malleable Iron Tee Handles. Only the best red brass is used, and each cock is tested with 200 pounds hydraulic pressure.

Every Plumber Wants to do Good Work

If he will add to his mechanical skill goods of Quality, he will succeed in his desire and have satisfied customers as well. We have the means to this end in our complete line of

Mueller Patent Cap Stop and Waste Cocks

The patent cap protects the ground surfaces from all foreign substances, and keeps the cock in perfect working condition all the time. Interchangeable from right to left by a quarter turn of the cap.

Write for Prices and Literature

TRADE MARK MUELLER REGISTERED

Works and General Offices
DECATUR, ILL.
West Cerro Gordo Street

H. MUELLER MFG. CO.

Eastern Division
NEW YORK CITY
254 Canal St., cor. Lafayette.

PLUMBERS' BOOKS

SANITARY PLUMBING AND DRAINAGE

By

JOHN W. HART, R.P.C.

With 208 Illustrations, 250 pp.

PRICE, $1.50.

Contents.

Sanitary Surverys, Drain Testing, Drain Testing with Smoke, Testing Drains with Water, Drain Plugs for Testing, Sanitary Defects, Closets, Baths and Lavatories, House Drains, Manholes, Iron Soil Pipes, Lead Soil Pipes, Ventilating Pipes, Water-closets, Flushing Cisterns, Baths, Bath Fittings, Lavatories, Lavatory Fittings, Sinks, Waste Pipes, Water Supply, Ball Valves, Town House Sanitary Arrangements, Drainage, Jointing Pipes, Accessible Drains, Iron Drains, Iron Junctions.

STEAM AND HOT WATER FITTERS' TEXT BOOK

By

THOS. E. M'NEIL.

PRICE, $1.00.

Contents.

Tools, Fittings and Pipes, General Questions on Heating, Low Pressure Steam, Two-pipe Steam Heating, Single Pipe Low Pressure Steam Heating, Indirect Steam Heating, Hot Water Heating, High Pressure Steam Heating, High and Low Pressure Steam Heating, and Power Plant, Exhaust Steam Heating Power Fan or Blower System of Steam Heating and Ventilating; Design, Estimate, Specification; Dwelling House Heating, A Successful Heating Job.

HINTS TO PLUMBERS

on

Joint Wiping, Pipe Bending and Lead Burning

By

JOHN W. HART, R.P.C.

Third Edition, Revised and Corrected.
184 Illustrations, 313 pp.

PRICE, $1.50.

Contents.

Pipe Bending, Square Pipe Bendings, Half-Circular Elbows, Curved Bends on Square Pipe, Bossed Bends, Curved Plinth Bends, Rain-water Shoes on Square Pipe, Curved and Angle Bends, Square Pipe Fixings, Joint-wiping, Substitutes for Wiped Joints, Preparing Wiped Joints, Joint Fixings, Plumbing Irons, Use of "Touch" in Soldering, Underhand Joints, Blown and Copper Bit Joints, Branch Joints, Block Joints, Block Fixings, Astragal Joints, Pipe Fixings, Large Brance Joints, Large Underhand Joints, Solders, Autogenous Soldering or Lead Burning, Index.

PRACTICAL HOT WATER HEATING, STEAM AND GAS FITTING, ACETYLENE GAS, HOW GENERATED, HOW USED.

PRICE, $1.50.

Illustrated.

Showing the latest and most approved Devices used, the value of Acetylene Gas as an Illuminant Discussed from Various Points of View; Every Class of Generator Described; Gas Burners and Piping; also the Best and Quickest Methods of doing Hot Water Heating, Steam and Gas Fitting, up to the Present Date.

By

JAMES J. LAWLER

and

GEORGE S. HANCHETT, S.B., M.A.I.E.E.

Addenda.

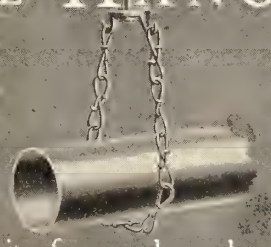
Complete Steam One-pipe Circuit System, A (insert); New Special Hot water Distributing Fitting; Soft Coal Steam and Hot-water Heater, A.

MacLean Publishing Co.

LIMITED

MONTREAL TORONTO WINNIPEG

NIAGARA CHAIN for PIPE HANGING



Most convenient and neatest as well as the most economical hanger on the market.

Pipe may be hung any distance from ceiling with this hanger.

Permits of easy and exact adjustment.

Write for samples and prices.

ONEIDA COMMUNITY, Ltd.
NIAGARA FALLS, ONTARIO.

Backed by a Guarantee

All our **Bronze** Powders and **Liquids** have the distinction of being **Guaranteed.** All plumbers and steamfitters know the necessity of having the **Best** in Bronze Powders and Liquids.

OURS NEVER FAIL

The Canadian Bronze Powder Works
MONTREAL—TORONTO

No order too large Works at Valleyfield

If your nearest dealer does not keep our goods, write us.

Advance of Practical Sanitary Science

ARTICLE III.

Written for The Plumber and Steamfitter by William Holley, Montreal, Associate Royal Sanitary Institute of Great Britain.

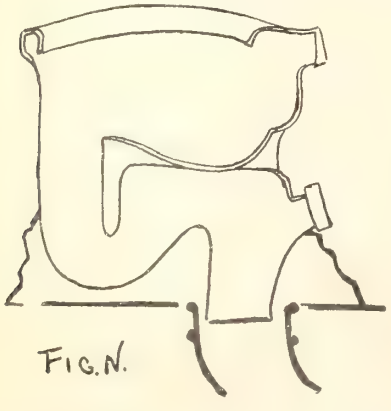
The choice of suitable sanitary appliances, however, is not the only special function of the plumber, or of the person in charge of a plumbing job, for the best of fixtures may be very easily

Fig. M.

rendered unsatisfactory and unsanitary by careless workmanship during installation. It is up to him to see that this does not happen.

This statement is particularly applicable to water closets and is true regarding many which are in use at this time in our towns and cities. This is largely due to a lack of appreciation of sanitary principles on the part of those who did the actual work or to absolute careless workmanship. Perhaps more than is thought this can be directly attributed to the unsatisfactory state of control on the part of our health authorities.

In Canada each city or town has its own health, building and sanitary by-laws—or is supposed to have—but in many places they are so crude as to be practically non-existent. In other places they are so badly enforced as to re-



sult in putting a premium on scamped and unsanitary work. In one large city, which shall be nameless, the staff of inspectors to examine the plumbing is so inadequate that although the by-laws state that no building shall be occupied until a certificate has been granted passing the plumbing work, it his, in many cases, been impossible to inspect it finally and make the smoke test until months after the building has been occupied, and in very many cases inspection has not been made at all. This naturally leads to scamped work on the part of some unscrupulous tradesmen, who will, thereby, make a little extra profit, or who will take the job at a closer price than they would have done if they knew it would be thoroughly inspected. In this town the writer saw the sanitary features of some most costly and up-to-date closet fixtures being frustrated by deliberately scamped work in installation. As a whole, the plumbing trade is highly honorable, but there are black sheep in every fold.

Making Connections.

Making the connection between the porcelain of the closet and the soil pipe

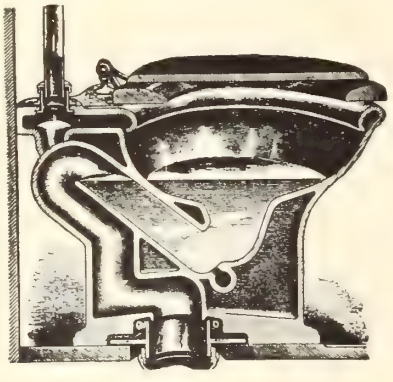


Fig. P.

is one of the instances where good work counts for much, and poor work is so dangerous, since it has been proved repeatedly to be a source of real danger to the health of the inhabitants to have the foul odors of the soil pipe emitted into the home, and this point in the plumbing installation has long been regarded as one of real weakness. So much has this been considered a weak point in a plumbing system that the health authorities of the London County Council have laid down minute details as to how these connections should be made, both to iron, lead and earthenware soil pipes. At this time, they insist that the joints of practically all closet bowls used with the metropolitan area "shall be visible at all times so that it can be easily inspected and repaired, if needed, and so that a properly made joint shall be made at the time the utensil is installed."

This means that the outlet of the bowl must be at the back or side, instead of underneath, as is the general practice on this continent. This does not make so neat a fixture but it certainly gives a far better opportunity

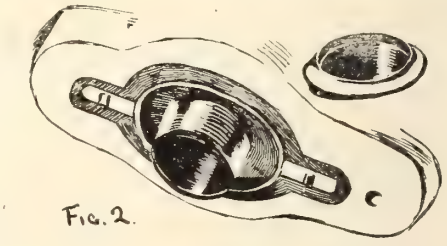


Fig. 2.

to make a good joint between the soil pipe and the bowl. (Fig. M illustrates.) It will be observed that the hub of the soil pipe must come up above the floor and thus allow a good joint to be made. Further, if a lead soil pipe is used a brass hub must be soldered to the lead, in which to insert the porcelain spigot of the closet and a sound joint be made with oakum and cement.

In this country, where the climate is so very severe, it is far more important that these joints should be very well made, and under no circumstances to allow the escape of polluted air and foul odors into the home, for during very cold spells it is almost impossible to ventilate the air of rooms properly, which is easily accomplished at all times of the year in Great Britain. Again, the practice of installing closet fixtures in the very centre of the house, with no opening to the outside air, but only in very many of the smaller homes, into the dining room or kitchen, calls

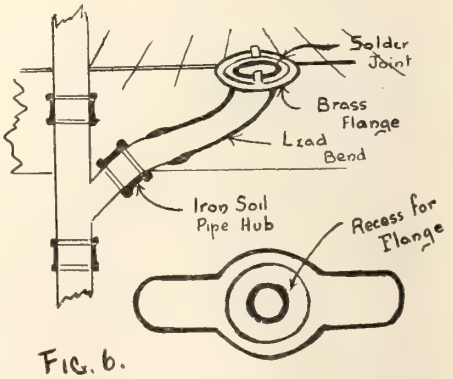


FIG. 6.

for much more care in this regard than in the older country, where it is compulsory for the closet room to be connected directly to the outer air by a window which is made to open.

Putty Connections Condemned.

In view of these conditions, there is one method of making these joints largely practiced in this country which should be condemned when used inside houses or buildings to be inhabited. It consists of the hub of an iron soil pipe being brought up to the level, or near about, of the finished floor of the apartment and the spigot of the bowl being inserted into it. (Fig. N illustrates.) It is almost impossible to make an air tight joint with this method, and if one should be made it is impossible to guarantee it to remain so for any time. The hub of the iron pipe, if brought perfectly level with the floor, is always much larger than the spigot of the bowl, and this space has to be made up somehow. This is usually attempted by the use of putty, which is inserted inside of the hub to reduce it in size, or around the base of the spigot to be forced into the opening when the bowl is being placed home. With the best of care, it is impossible to tell if the putty is really filling up this extra space at all points, as it is impossible to see, and if it should so happen, the smallest jolt of the bowl after the putty has dried will cause it to shatter and fall away down the pipe, leaving the opening free, but unsuspected, for the escape of the foul odors from the drain. Any slight shrinkage of the soil stack will cause the putty, after it is dry, to crumble and fall away in powder, which also adds to the undesirability of this method.

Another feature in connection with this way of making the connection is worthy of note; that is, it is most difficult to exactly have the iron hub finish neat with the finished floor level—very often it is far from that—which adds to the undesirability of the joint, and the writer on one occasion saw an instance where the calculations were not quite correct, and when the bowl was inserted only about one-quarter of an inch of the spigot entered the hub of the soil pipe.

No thoroughly up-to-date sanitarian will adopt such practice, but this is the method used in some instances where first-class and costly fixtures have to be installed, and where other methods of making the connection are provided for. This class of work falls short of modern requirements, and should be uncompromsingly condemned.

A Better Method.

Another method, similar, but much superior, and which is the only one which can be used with some forms of bowls, is made by means of a lead bend being connected to the iron soil pipe by means of a brass thimble soldered to the lead and calked into the hub of the soil pipe. The open end of the lead bend is brought up above the floor when roughing in the work, and is cut off at the finished floor level and carried back to make suitable connection when the fixture is about to be installed. The lead hub into which the spigot of the bowl is inserted is made to hug the spigot tightly, not as in the previous case, where a large space has to be filled. The portion which is tafted back provides a suitable receptacle for the mastic used to make a proper air tight seal when the bowl is being forced home. By this means the lead hub can be made to come perfectly up to the base of the porcelain, for it is prepared at the time the bowl is to be installed, and when being tafted back can be much better attached to the surrounding woodwork. There is a class of bowl being largely used in this country to which the use of this joint is the best that can possibly be used, but it is surprising that so many of this type are being used when there are others which provide a much more satisfactory and better means of attaching to the soil pipe—always a point of great importance.

Brass Floor Flanges Satisfactory.

A joint which, in the writer's opinion, is much more serviceable and satisfactory is the one using the brass floor flange. In this case, the base of the closet is countersunk around the spigot to form a receptacle for the brass flange, which is soldered to the top of the lead bend, which has been brought up along the floor, as in the last instance. This forms a good support to prevent the lead bend from falling away from its position, and also, if properly installed, makes a permanent connection between the porcelain and soil pipe, as the flange is screwed down to the floor and the porcelain bolted to the flange after a gasket of rubber or other packing has been inserted.

Nothing poorer than this should be used on up-to-date plumbing work, but it is a deplorable fact that very many bowls provided to be so connected are attached to the soil pipe in one or other of the methods previously mentioned. This is, no doubt, to save time and labor, but it sacrifices a reputation for first-class work, on the presumption that it is not seen and, therefore, will not matter. (Figure 6 illustrates.)

Properly Made Joints Important.

The importance of properly made joints at this point cannot be too strongly urged, for it is clearly obvious that immediately this point is not perfectly sound the sealing of the trap is an irony worse than useless, since it inspires confidence in most dangerous situations. Very many attempts have been made to improve this joint or to provide for its being better made at the time of installation.

One attempt took the form of the base at the front part of the bowl being made of a separate piece of porcelain, which was inserted into its place after the bowl had been connected to the soil pipe, thus allowing the joint to be got at whilst being connected. The piece of base after being inserted to its proper place, was fastened by two screws through holes provided, into the floor. This was not satisfactory, as it did not allow of the joint being much more available, and the piece of porcelain base was liable to be easily broken or put out of place and otherwise rendered useless.

Another very ingenious way to improve the joint, and at the same time to make an unsound joint to be easily observed, is shown in Fig. P. The air-tight seal was provided by about one pint of water being contained in the joint, and immediately the joint became defective or broken the water would escape on to the marble floor slab, which had to be specially used with this bowl, and thus proclaim to all who observed that the joint was defective. The water was prevented from escaping down the hole in which the soil pipe went by means of a countersunk channel in the marble slab. This joint was too complicated and costly to be very generally adopted, and the results of its use were not altogether satisfactory.

The great law of simplicity being the primary sanitary lesson asserted itself here, and this joint had to be ascribed to failure on account of violating that law. It was too complicated.

Figure 2 illustrates a connection from the closet bowl to the soil pipe which at the present time is finding much favor with American architects when designing hospitals and similar buildings. It is a very costly joint, and is known as the Perfect Sanitary Screw connection, the general feature being that the spigot is made of brass and is attached to the porcelain bowl by means of a locking arrangement and patent cement, which virtually makes it an integral part of the bowl. This spigot screws into a hub specially provided to receive it and which has been attached to the soil pipe. In attaching this bowl to the pipe the whole bowl is screwed round and round until the threads on the spigot of the closet are all taken up in the hub prepared to receive it. One feature which causes much trouble where this joint is being used is that when connecting the special hub to the soil pipe, whether it be iron or lead, it is absolutely necessary that it should be put in perfectly square, exactly so, for if not, it will be impossible to screw the bowl home when the fixture is being installed. This point if not realized by the men doing the roughing work is sure to cause endless trouble later. When properly made this is an excellent joint, and many of the public buildings of this country are now using them. It certainly can be regarded as the most perfect way of making this troublesome joint when care is taken, and it is to be regretted that its price militates against its more general use.

Make good use of all the good advertising matter sent you by manufacturers. This is gotten up at large expense in order to aid you in increasing your sales and it should be used intelligently, not allowed to lie in a dusty pile in a back corner of the store.

PLUMBER AND STEAMFITTER

OF CANADA

The MacLean Publishing Co.
Limited

JOHN BAYNE MacLEAN - - - President
W. L. EDMONDS - - - - Vice-President
H. T. HUNTER - - - Business Manager
WESTON WRIGLEY - - - Managing Editor

Publishers of Trade Newspapers which circulate in the Provinces of British Columbia Alberta, Saskatchewan, Manitoba, Ontario, Quebec Nova Scotia New Brunswick, P. E. Island and Newfoundland

OFFICES:

MONTREAL - - - - - - 232 McGill Street
Telephone Main 1525
TORONTO - - - - - - 10 Front Street East
Telephones Main 2701 and 2702
WINNIPEG - - - 511 Union Bank Building
Telephone 3726
LONDON, ENG. - - - - - 88 Fleet Street, E.C.,
J. Meredith McKim
Telephone, Central 12960

BRANCHES:

CHICAGO, ILL. - - - - - 1001 Teutonic Bldg.
J. Roland Kay
PARIS, FRANCE - Agence Havas, 8 Place de la Bourse
MANCHESTER, ENG. - - - - 92 Market Street
ZURICH, SWITZERLAND - - - Louis Wolf
Orell Fussli & Co.

Subscription, Canada and United States, $1 00
Published Twice Every Month
Cable Address { Adscript, London / Adscript, Canada

ASSOCIATION OFFICERS.

National Association of Master Plumbers, Steam and Hot Water Fitters of Canada :

Past President—A. J. Hammond, Winnipeg.
President—F. G. Johnson, Ottawa.
Vice President—John Watson, Montreal.
Secretary—John A. Gordon, Montreal.
Treasurer—H. Mahoney, Guelph.

Provincial Vice-Presidents :—
Ontario—Ben Noble, London.
Quebec—Joseph Lamarche, Montreal.
Nova Scotia—G. A. Wooten, Halifax.
New Brunswick D. Shea, Fredericton.
Manitoba—C. E. Gate, Winnipeg.
Alberta and Saskatchewan—E. J. Young, Calgary.
British Columbia—Bert Weeks, Vancouver.

Standing Committee Chairmen :—
Legislation—Hugh Wallace, Hamilton.
Apprenticeship—E. H. Russell, London.
Sanitary—H. A. Knox, Ottawa.
Essay—A. J. Hammond, Winnipeg.

The Annual Convention of the National Association will be held on August 21, 22 and 23, in the Plumbers' Hall, 90 St. James street, Montreal. Representatives from all parts of Canada will be present and a full attendance of the trade is important.

IMPORTANT SUBJECTS FOR DISCUSSION.

Two of the greatest problems confronting masters plumbers to-day are the apprenticeship question and its twin brother—the making of trade agreements with trade unions. By no means new to the trade they are especially important at the present time and worthy of being made leaders in the program of next month's national M.P.A. convention to be held in Montreal on August 21, 22, and 23.

The situation in Toronto should be given serious consideration by the trade in other cities. The employers have practically refused to enter into any agreement with the journeymen except on an open shop basis in which the bosses will be able to control the apprenticeship problem. The strike which has now lasted ten weeks (and is likely to last at least ten more) is not over a question of wages. The employers are willing to pay the advance asked to all competent men, but the masters (most of whom were members or officers of the journeymen's unions only a short time ago) have grown tired of the attitude of the journeymen working under a trade agreement and say they will have no more of it. According to them the journeymen have become practical masters of the shops and have developed a large number of loafers who are not worth the wage asked. It is further alleged that the journeymen by discouraging apprentices have created an artificial scarcity of journeymen, this resulting in the men becoming careless in their work and regardless of the destruction of their employers' materials.

If these conditions have developed in Toronto masters plumbers in other cities throughout Canada will do well to take steps to prevent a similar situation growing up in their localities. As will be seen by another article in this issue an even more dictatorial attitude has been developed by the journeymen's "trust" in San Francisco, all youths except the sons of master or journeymen plumbers being denied the right to learn the plumbing and fitting trade. When unionism is misled into adopting such regulations employers will earn the approval of the public (and most trades unionists also) by making a strong stand against the development of such a labor monopoly.

The strike situation at present looks none too bright for the journeymen. They have induced many of the smaller employers to sign their agreement and about 200 union men are at work on the new scale. The bosses, on the other hand, claim to have about as many non-unionists at work. Journeymen are constantly leaving town and the masters are gradually increasing their staffs. The masters are doing a lot of roughing-in work and some work is being done on pressing jobs. The financial loss to the employers is not very great as the work will come their way sooner or later. On the other hand, each journeyman out of work has lost from $120 to $150 in wages over their strike pay allowance. This is likely to be doubled or tripled, followed by heavy assessments to replenish the union treasury. If figured out it will be seen that it will take years for the average striker to regain the lost wages, even though they win the strike and are granted 5 cents per hour of an increase. Intelligent union men realize that the strike is a poor weapon to use in modern times. Before employers learned the lesson of organization strikes were often successful, but a strike is essentially a test of financial endurance with victory certain for the side with the longest bank account.

The Toronto strike should teach many lessons to both masters and journeymen. The former will undoubtedly use it in the discussions to be held at Montreal and journeymen through Canada are bound to profit by the experiences of their brothers in Toronto.

The Plumber and Steamfitter draws attention to the articles in this issue on trade agreements and the apprenticeship problem and invites short letters for publication from either master plumbers or journeymen. This paper is an independent forum for the discussions of any subject of interest to any branch of the plumbing or heating trades.

STEAM vs. HOT WATER.

George Stinson, of London, the winner of the prize given last spring for the best article on the merits of hot water heating asks that the discussion be continued, saying that he is willing to defend the points made in his article published in The Plumber and Steamfitter of April 17.

The trade has much to gain by a discussion of subjects helpful to them in the work of installing satisfactory plumbing and heating apparatus and the columns of this paper are always open for short letters or articles. Who will be the first to accept Mr. Stinson's invitation?

ON PREPARING PAPERS.

In a recent issue of the English Plumber and Decorator appeared an instructive article on "Some Hints on the Preparation af a Paper and its Illustrations," by W. A. Young. The article comes under our notice at a very opportune time, now that the convention of the National Master Plumbers' Association is fast approaching, when various important papers are being prepared.

None are too well acquainted with the methods of systematic preparation of papers, and are therefore open for instruction. It is a hopeful sign to see the comparatively large number of young men who either attend conventions or take an increasing interest in live issues of the day pertaining to their trade. Some of them give papers at conventions and more would do so if confident that they would acquit themselves with credit.

The first head under which Mr. Young discusses the question is "Choosing a Subject." This is truly an important question and is deserving of first place. As the writer says, the choice of a subject is usually more troublesome than the actual work of writing. The assertion is ventured that a number of papers read at conventions are not worthy of a permanent place in the records of the

association simply because of an ill chosen subject and one in which very little interest can ever be aroused because of its obsoleteness and untimeliness.

The choice of subject is surely difficult. The subjects chosen have either been too comprehensive to admit of adequate treatment in the space and time allowed, or they have been discursive, and consequently, while sometimes provocative of useful discussion, have not disclosed information likely to be useful to the members, who presumably come to the meeting wishing for information in connection with the profession.

The first and chief characteristic of a really useful paper lies in its practical character and its completeness. Moreover, if the essay is to be complete it must be short to allow of the full discussion of the subject in the time allowed. To be able to prepare a paper which will be practical, timely, complete, and of a length perfectly adapted to the time allowed, requires a complete mastery of the subject to be dealt with, and this means elaborate forethought and fore-reading. W. A. Young says: "It is one of the surprises of journalistic work to find what a lot of people there are who know nothing about many matters most nearly connected with their own daily occupation. As a final suggestion in the preparation of the matter, nothing pertinent to the matter ought to be omitted from the paper."

Regarding style two suggestions are offered: First, avoid the use of the imperative mood in conveying information. Nothing does more to unsay a statement meant simply as information than a loud, imperative, or declamatory tone. Second, use the first person singular very sparingly. This precaution is suggested simply to save the journalist an endless amount of trouble in transposing the remarks from direct to indirect narration.

In regard to revision of article and marking of proof. When the first draft has been written it should be put aside for a few days before the revised, clean copy is made. This plan allows the ideas, remarks, comments, and all the rest of the good things which have been committed to paper without banishment from the mind to simmer there. Then when the revision is undertaken little errors and omissions will be noticed and general improvements can be introduced.

All the above suggestions are offered with the hope that they will be useful and instructive to all those who in the future prepare papers for conventions of our National Master Plumbers' Association.

STATEMENT FROM SAN FRANCISCO M.P.A.

The Association of Master Plumbers of the city of San Francisco have issued the following statement for publication:

In June, 1906, the Journeymen's Society notified us that it had peremptorily closed the roll registering apprentices, excepting to the sons of its own members, thereby rendering it impossible for the son of any master plumber, or the son of any other person, who was not registered prior to April, 1905, to learn the trade of plumbing or gasfitting.

Again, the Journeymen's Society notified us that if any master plumber wished to execute mechanical work with his own hands, i.e., with tools, and to be rated as a "fair shop," then he must personally apply at the headquarters of the Journeymen's Society and request that its agent issue to the appealing master plumber a "Permit Working Card"; but, as a pre-requisite to the issuance of this "permit card," the master plumber must promise to abide by all such rules and requirements as the said U.A. 442 shall demand.

And further, unless a master plumber has such "Permit Working Card," the members of the Building Trades Council will not work upon a building with him.

Then, again, we believe that those methods by which the journeymen receive and reject applicants for membership in the U.A. 442 are neither wisely nor justly applied, nor will they redound to the welfare of the journeymen; and we know that in conjunction with these actions herein related, and others taken by the Journeymen's Society, a false scarcity of labor has been created, which has forced the wage rate far in excess of the nominally official minimum of $6 per day, and we believe, thereby seriously adding to the burden of our city and retarding its rehabilitation and development.

And we were further notified that the Journeymen's Society had declared a "boycott" upon certain plumbing materials and without giving us any explanation whatever, the boycott was immediately applied.

Now we, the Association of Master Plumbers, condemn all these demands and actions taken by the U.A. 442 and as herein related, because that under justifiable regulations, all these avenues which naturally would be open to the youth of our country, such, for instance, as that of the right to learn a trade, should be free and open and absolutely without discrimination as relates to class or individual; we believe that this action taken by the Journeymen's Society relative to apprentices is pernicious to all proper interest and against the public weal. We also believe that the master plumber shall enjoy the right to perform manual labor if he so desires, and that no man nor set of men has, or have the right to assume the dictation of the conditions under which he shall labor. We believe in the principle of the "consent of the governed," that principle upon which all past concessions have been made, and upon which we still fimly stand.. We also believe that these sentiments from which these actions of U.A. 442 were born, are contrary to those principles upon which our nation is founded and if persisted in will seriously disturb the basis of business and result in a chaos calamitous to ourselves, the journeymen and the public at large.

Now, since those means by which we have successfully adjusted all past differences now fail us, therefore, we present this public statement in the hope that the judgment of the court of public opinion shall prevail..

THE MASTER PLUMBER.

A very interesting and instructive address on the above subject was delivered by C. R. Horn, of Lorain, O., at the annual convention of the Ohio State Association of Master Plumbers, recently held at Columbus. In introduction he expressed his confidence in the fact that a large majority of men would in discussing such a subject be more efficient in and accustomed to plucking the mote than in seeing the beam. In speaking of the master plumber as he is he thought that in some cases there was a grave lack of business ability, and that the value of co-operation and organization was under-estimated. Union is strength, and the fair and legitimate application of this truth will help to return to each and every individual who is willing to put forth his best efforts in behalf of any organized plans and co-operation, his full quota of the fruits that are bound by all precedent to come to those who work and wait. Speaking of the value of co-operation, "Our interest in association work, whether local, state, or national, should be so keenly manifested on the part of every individual member as to elevate him far above any thought or desire to take any undue advantage of a brother member, even though the opportunity should present itself." The whole is greater and stronger than any of its parts. A large majority of the troubles and failures may be fairly attributed to ignoring the value of co-operation.

Success never forces itself upon any one, but it is attained by keeping everlastingly at it. That man is wise who will see to it that some little improvement is made in his business and its surroundings each day, for, at the end of the year, he will marvel at the progress that has been made.

Tile as a Sanitary Necessity

Discussion on the Uses of White or Colored Tile

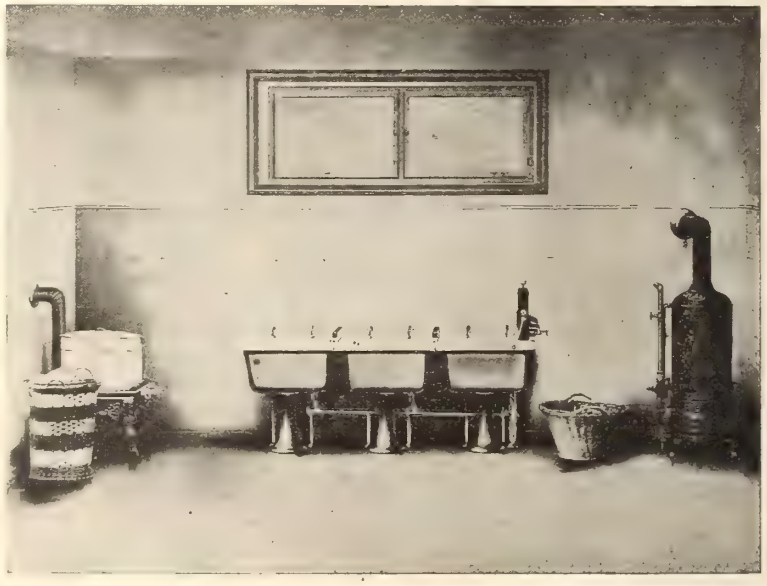
Tiling first came into general use in America as a wall and floor covering for bath rooms, where the sanitary and non-absorbent qualities of the baked clay product made it especially appropriate as a protective covering for floors and walls that were being constantly splashed with water. The bath room tiling was nearly always done in white because white was not only suggestive of scrupulous cleanliness, but because a white floor or wall was the one upon which dirt or soiling of any kind could be most quickly detected. The possibility of being easily soiled has made white always suggestive of cleanliness. There is, however, a certain glaring monotony about the all white floor or wall which however suggestive of neatness, has a disagreeable effect upon the eye. This monotonous appearance of an all white surface has been, in the case of tile, much emphasized by a careful selection of the individual porcelain pieces and by setting into one wall or floor only those of exactly the same tint, thus robbing the product of its natural richness in texture due to the fact that the individual pieces taken "in the run of the kiln" vary considerably in shade after having been submitted to the uncertain action of the fire.

A Tiled Verandah Floor.

The white tile has its legitimate use in bath rooms, hospitals, kitchens and other places where absolute cleanliness is the main requisite. In these places, and in many others, the white tile should predominate. Its exclusive use, however, without the pleasing effect of color variation, should be avoided. Colored tiling is just as sanitary and just as durable as the white clay product, and if used harmoniously, and with taste, it is far more decorative. The colored glazed wall is just as impervious to septic matter as the white variety. It is likewise just as easy to keep clean. There is, therefore, no logical reason why the monotonous monochrome appearance of the all white wall should not be relieved by the application of a suitable tinted or colored tile.

The plumbing fixtures of the modern bath room are almost necessarily white. Their scrupulous cleanliness cannot be better emphasized than by the use of a tile or ceramic mosaic floor or wainscoting of colored tile. Where the colored wainscoting is used the rest of the wall up to the ceiling can be covered with white tile, thus giving the walls a most decorative appearance. The bath room in a modern house is often rather small, or too long or narrow. This lack of spaciousness or of just proportion, in the appearance of the bath room, can often be corrected by an appropriate design by either colored ceramic mosaic of glazed tile on the floor and walls. The same effect may be produced in walls of white tile by a judicious use of panelling marked off by tile work of another color. In many respects, the modern bath room is one of the most decorative rooms in the house. To enclose its spotless white plumbing fixtures within an all white floor and wall is not only sacrificing the decorative possibilities of the clay tile, but it gives the room a cold and hospital-like appearance which is disagreeable to the eye, and is a positive lack of comfort. The architect or home builder who has a proper appreciation of the comfort of suitable decoration, should avoid the mistake of an all-white bath room.

In the hospital, also, the exclusive use of the white wall and floor tile is to be avoided. The life of the inmates of the hospital is at best cold and cheerless. Any comfort or pleasure which they can derive from pleasing surroundings should not be denied them, especially when there is no logical reason for doing so. No one should expect the wards and operating rooms of a hospital to be decorated with carpets, pictures and other ornaments which are used to add to the attractive appear-



Tiling in the Laundry.

ance of the drawing room, for the simple reason that these furnishings become the refuge places for dirt and other

Tiling in a Modern Kitchen.

septic matter. When, however, the very tile, which is used as the most germproof and cleanly floor covering, can be obtained in decorative or pictorial designs of all kinds, it is hard to understand why advantage should not be taken of this fact to relieve the monotony of the existence of the patients. This fact has been recognized in England and other European countries, so that the walls, and even the floors, of hospitals in these countries are now covered with the most beautiful decorative tile. In the hospital, as in the bath room, the white tile should predominate, because white always has suggested, and always will suggest, cleanliness. But the hospital architect who takes full advantage of every excellent quality of the baked clay material, will see to it that the cold and monotonous appearance of the glaring white wall is relieved by a judicious use of color.

In cold storage rooms, elevator shafts, air shafts and other similar places where the idea of decoration is quite superfluous, the exclusive use of white tile is not only permissible, but should be encouraged. But bath rooms, hospitals and other places where decoration is an advantage, the very whiteness of the tile should be emphasized and also relieved by colored borders, panels, wainscoting and designs.

SLIGHTLY MIXED ON HOSE.

Now and then a bit of humor comes to cheer the everyday life of the man who goes "out on the road" to sell goods. A recent experience of one of the salesmen for the Crane Co. is an illustration in point.

It was the salesman's first trip. In a small town in Arkansas, business was greatly crippled, owing to high water, and he was not surprised to be told by the buyer for the leading hardware store that, in the circumstances, there wasn't a thing in the traveler's line that the buyer could use.

The abundance of water everywhere visible suggested a question to the salesman, so he inquired: "Don't you intend to carry any garden hose this season?"

"Oh, yes; I carry a stock of hoes all the time. Do you mean to tell me that the Crane Co. sells hoes?"

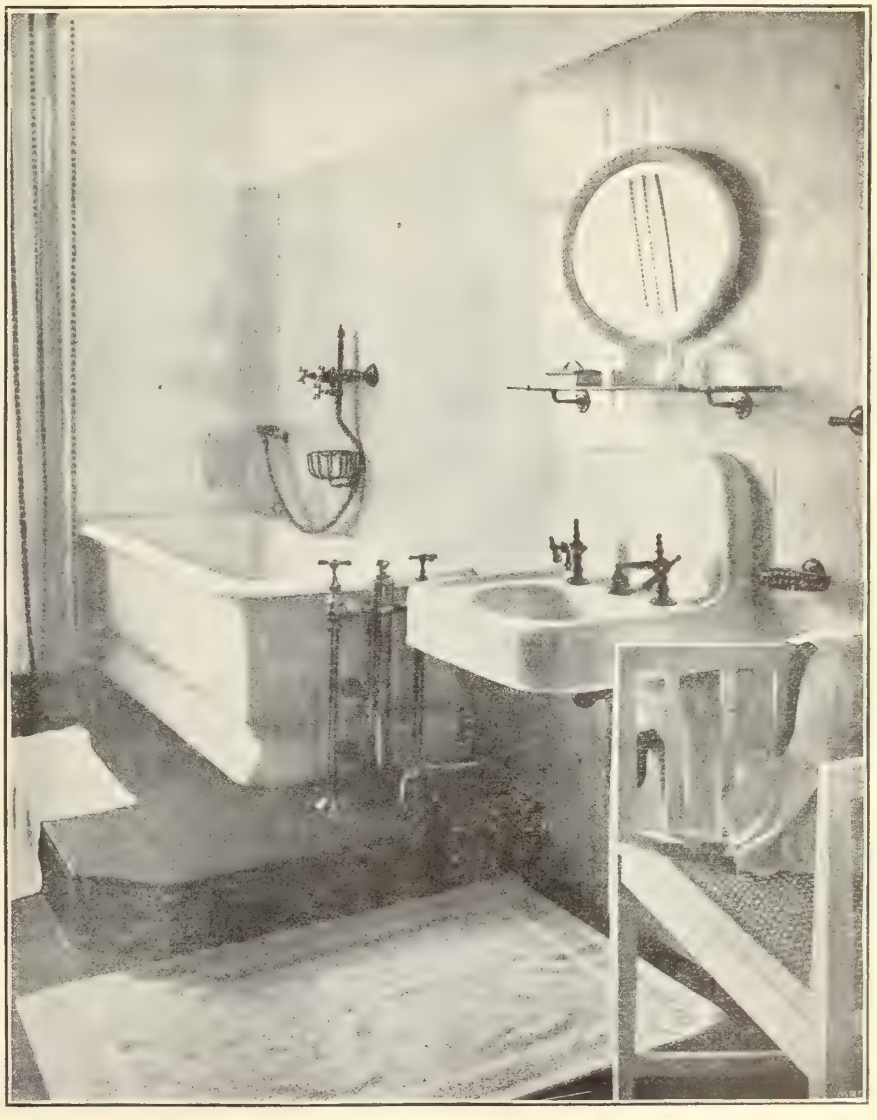
"Yes, indeed. We carry at our branch a full line of all kinds of hose."

"Well, that's a new one on me. I never heard of a plumbing supply house selling a line like that."

"You haven't? Why, all first-class houses in this line handle hose."

"Well, our principal demand in this country is for cotton hoes; so if you have the kind we want, I guess I could give you a small order."

Thus encouraged, the salesman produced a sample of three-quarter inch cotton hose. Then the buyer laughed and the salesman joined in the mirth, and both decided, as with a single voice, that it was up to each to inquire "What's yours?"



Bath Room with Tiled Floor.

Lead which contains a small quantity of tin and antimony does not corrode as readily as pure lead. When exposed to a damp atmosphere the surface will not turn white as rapidly.

PASSING OF WOODEN LAUNDRY TRAYS AND SINKS

Time was in the history of plumbing when most of the fixtures were made of wood. In the evolution which ensued, some of the fixtures, like bath tubs and pantry sinks, were lined with copper, zinc or other sheet metal, and at that time were looked upon as the perfection of sanitary ware. Conditions changed, and manufacturers put upon the market plumbing fixtures which, on account of their snowy whiteness and impervious surfaces, forced the old copper-lined fixtures to the scrap heap. Some relics of the old-time fixtures still remain, however, and it is noted that health boards are now putting them under the ban. In this connection, points out Modern Sanitation, it is interesting to note section 13, Table XIII, of the Cleveland Code, which provides: "The installing or maintaining of fixed wooden wash trays or sinks is prohibited in any building or part of building designed or used for human habitation, but may be used in any building where such trays are in daily public use, such as public laundries and dye houses.

"Wooden troughs or sinks, with or without metallic linings, shall be allowed only for bar sinks, soda fountain sinks or dish sinks in hotels, restaurants and public kitchens, and may be lined only with copper or lead."

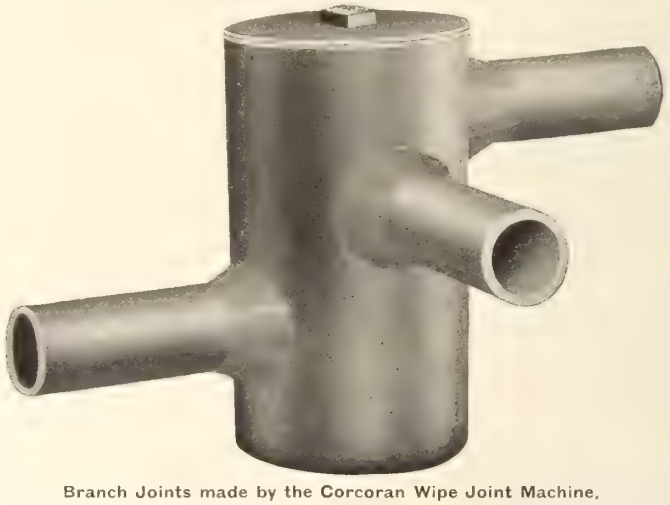
In keeping with section 13 is section 15 of the same title. Section 15 provides that "no new copper-lined wooden bath tubs shall be installed, nor shall any old fixtures of this class be recommended in any location where it had not been personally set. No old tub shall be relined. Any defective bath tub condemned by the inspector shall be removed."

The sweeping condemnation of wooden fixtures, whether metal lined or unlined, shows the temper of health boards where wooden plumbing fixtures are concerned. So far as bath tubs are concerned, however, we doubt if any ordinance is required to prohibit their use. Twenty-five years ago 99 per cent., perhaps, of the bath tubs installed were made of wood and lined either with zinc or copper, but within that quarter of a century such a revolution has been wrought in the manufucture of porcelain enameled goods that metal-lined wooden bath tubs have practically been driven from the market and porcelain enameled ware now supplies about 95 per cent. of the bath tubs used. This supplanting of the copper-lined bath tub by the porcelain enameled ware is but another example of the law of survival of the fittest, as it has been the desire of householders to have in their bath room fixtures that are inviting to sight and touch; something to be proud of and shown to friends as one of the desirable features of the house, not disgusting and unsightly fixtures that always look unclean and are hidden in dark corners of the house, as in unlighted closets under stairways.

What has been done by porcelain enameled ware toward supplanting the old metal-lined bath tub, has also been done by porcelain enameled sinks, which have relegated to the past plain cast iron, galvanized iron and other types of kitchen sinks; it needs no prophetic vision then to see that wooden laundry trays, also cement and soapstone trays, are doomed, and that the new fixtures will be of porcelain enamel.

CORCORAN WIPE JOINT MACHINE.

Condition, it is said never creates a demand without sooner or later providing its supply, and it remains for the Corcoran Wipe Joint Machine to meet the demand, or rather necessity, for a better, quicker and cheaper method of wiping joints. Heretofore, wiped joints have always been a "bugbear" to water and electrical companies; causing more loss of valuable time and material than any problem they have had to contend with. It has always been a difficult thing to obtain an expert joint wiper, and then his work could never come up to the standard set by the Corcoran wipe joint machine, manufactured by the United Brass Manufacturing Co., Cleveland, Ohio.



Branch Joints made by the Corcoran Wipe Joint Machine.

Whether a man has had experience in wiping joints or not makes little difference in using this machine, as it can be operated by anyone of intelligence after reading the directions. The joints made by the machine are better than the hand wiped kind because the soldering metal is used at more extreme heat than in hand wiping and it is a well konwn fact that the hotter the metal the stronger the joint.

From an economical standpoint this machine is a good investment, it uses less solder (which makes a neater joint) and requires no trained man to operate it. Judging from the amount of work it will do one would think it a big heavy, cumbersome appliance, but it is not. It is a little machine that gives big results. It can be used in the shop or on the job. The greatest recommendation for the machine is that those who were the most skeptical, and have used it under the most trying circumstances, are now its staunchest and most enthusiastic advocates.

DEFECTIVE STRUCTURAL STEEL.

F. H. Cowles, writing in the New York Herald, charges that the structural steel supplied for use on the American market contains deadly defects, holes being filled with putty, rust scars concealed and cheap lead used to hide disintegration and prevent detection of weakness. The recent discussion on defective railway rails has raised public interest and drawn attention to the serious dangers of cheapness in materials upon which the lives of millions depend, the cutting down of the expense of production resulting from the competitive war for business. The correspondent says :

"That a large number of railroad wrecks in this country during the last year have been due to defective rails has become more evident with the investigations which have been made in regard to the process of steel manufacture.

"It may be of interest to the general public to know wherein the main defects in structural steel lie.

"It is the practice of the manufacturers of structural steel to give steel material a first coat of iron or red lead oil paint. The material employed is usually of an inferior grade in order that the product may be produced cheaply enough to meet the prices of competition. The steel is permitted to remain in exposed places for indefinite periods, when it is subject to dampness and in the case of the steel coming from certain mills in the Pittsburg district to the additional danger of a combination of ferric oxide with sulphurous fumes and carbonic acid existing in the atmosphere. These attacks are shown in the form of rust, which spreads rapidly and which eventually eats holes in the metal.

"To conceal these atmospheric attacks the iron or steel is covered with a rust colored oxide and often these patches are covered with putty, the color of

the pigments preventing detection. It was this process which gave rise to the recent rumors that our warships were put together in part with putty rivets. As the corrosion is well established, the covering of this material with red lead or similar coatings conceals the deadly work which is going on beneath, which may proceed at such a rapid rate as to endanger the structure in which the beams are employed and eventually cause a great catastrophe.

"It appears that quite as much attention should be paid to structural work as to steel rails insuring the safety of passengers on railroads."

FAN BLOWER AS A FACTOR IN INDUSTRIAL HYGIENE

Detailed studies have recently been made by the Massachusetts State Board of Health of various industries and the characteristic and unhygienic conditions of each clearly outlined. Through all these reports runs the conclusive evidence that most of these conditions can be materially improved by the introduction of suitable ventilating apparatus. This is particularly true of those cases where dust or fumes are formed at local points in connection with machines, vats, furnaces, and the like.

The fan blower is shown to be a reliable device for this purpose. Its positive and controllable action makes it applicable to all conditions, and the ready means of rendering practically harmless many occupations which are otherwise exceedingly unhealthy. It is primarily essential that the fan be locally applied; that is, that the source of dust or fumes be so hooded and connected with the fan that whatever is objectionable may be immediately drawn away, and not all to escape into the room.

Each industry is acquainted with applications peculiar to its own processes, but the general public has little knowledge of the methods employed. Perhaps the most familiar application of the fan for the handling of refuse and the removal of dust is in the planing mill, where each machine is hooded, and such a vacuum is produced in the connecting pipes that the fan is enabled to convey the waste material throughout long distances, pass it through dust collectors, and allow the clarified air to escape to the atmosphere, while the shavings and sawdust are as quietly deposited as may be desired.

In the shoe shop the fan is almost universally employed to remove the fine leather dust from the buffing wheels and other shoe-working machines. Here close hooding is necessary to economize the volume of air handled by the fan.

In the manufacture of derby and felt hats the essential material is fur heated with cyanide of mercury. Separation of coarse from fine hair is accomplished under the action of powreful suction.

Mechanically operated exhaust systems find helpful applications in connection with machines for pointing the pins of horn and celluloid combs, the "dusters" used for cleaning paper mill rags, the hydrofluric acid tanks of the glass cutter, the polishing lathes used by the manufacturer of optical lenses, and in the machine shop, the textile mill, the match factory, the lead works, and a hundred other industries.

In a system applied to a series of brass grinding and polishing wheels each hood is so constructed that by means of the swinging side plate the wheel may be readily replaced. Visors at top and bottom of the hood may be adjusted so as to include any desired portion of the wheel. The lighter dust is carried away by the air passing through the fan, but the heavier metallic particles fall to a hopper below, whence they can be periodically removed.

There is manifestly no limit to the variety of applications of the fan blower which may be made to improve hygienic conditions. It is perfectly evident that the objectionable features obtaining in most industries may be thereby removed, or their influence may be reduced very much, with a material result in the healthfulness of employes.

This is not altogether a one-sided question, for, broadly speaking, whatever conduces to the health of the employe increases his efficiency and improves the product. Although direct returns from improved conditions may be difficult to trace, yet in the light of the present so-called Welfare Movement, this feature should recive its due share of consideration by the employer. Experience has already proved the value of good light and ventilation and a comfortable shop temperature as a means of attracting the high-grade, self-respecting workman. The same influences are beginning to be felt all the way down the line of industrial efficiency.

MUELLER'S FIFTIETH ANNIVERSARY.

The H. Mueller Mfg. Co., of Decatur, Ill., are making preparations to observe a holiday in honor of the fiftieth anniversary of the Mueller business. The observance will be in the form of a picnic, in which all of the members of the company and all the employes will take part. The exact date has not as yet been decided upon, but it is probable that September 7th will be selected, as on this date the company took possession of the first buildings at the present site of the factory. The event will be in the complete manner in which the company always does things of that kind. The plant will be closed and the 700 employes will have a holiday with full pay.

In 1857 Hieronymus Mueller, founder of this enterprise, located at Decatur, and in a modest way began laying the foundation upon which the business now stands. Though a machinist by trade, he developed quite a lucrative patronage as a gunsmith. It was some years after when he first engaged in the manufacturing business, tapping machines being his chief product. This branch of his business grew and in 1895 he erected a large brick factory. The building since then has been gradually enlarged and more extensively equipped, until it now offers every facility for the manufacture of its various goods. Mr. Mueller lived to see only the beginning of this wonderful growth, and, faithful to the end, he spent his last days working in the factory, as industrious as his poorest employe. The business since then has devolved upon his children, through whose energy and the popularity of the firm's product, the Mueller goods are now standard with the trade in all parts of America.

SWIMMING POOLS.

Mr. John K. Allen is the author of a very complete book on "Swimming Pools," just issued by the Domestic Engineering, Chicago. It is the only work giving a detailed account of the construction, mechanical installation, water heating, etc., of swimming baths, as well as showing various types of installations, with 25 to 30 illustrations and charts. This book should readily find a place in the offices of architects and plumbers who are called upon to do this kind of work. It retails at fifty cents, and copies may be obtained in Canada from the MacLean Publishing Co., Toronto, publishers of the Plumber and Steamfitter.

AIR TRAPPED WASTE PIPE.

An air-trapped waste-pipe and how an amateur plumber relieved it is thus described in Power, of New York: In a factory where the boiler feed facilities consisted of a feed-pump, an ordinary injector and an exhaust injector (which last did the feeding) a new sink was installed so as to catch the overflow from the injector, caused by variation of load. Both injectors were put together and the sink placed under them. The waste-pipe from the sink was connected to a pipe that received the drips from the engines, pumps, heater, etc., and provided with the usual trap under the sink.

After everything was piped up, it was found that the steam pressure in the main drip-pipe forced the water out of the trap under the sink, thereby breaking the seal and allowing the steam to back up into the engine-room. In order to overcome this, a trap was placed in the iron pipe below the trap in the lead pipe. This arrangement was successful in holding back the steam, but after a few minutes' operation the water in the sink refused to run off. A $\frac{3}{4}$-inch hose with 30-pound water pressure was run down the pipe to force out any obstruction. As long as the hose was in operation the sink worked splendidly, but when the hose was removed the pipe instantly clogged. The suggestion was made that the trouble was due to air being trapped between the two traps in the waste pipe. A small hole the size of a pin was made, and the sink immediately emptied and worked all right.

Examples of British Plumbing Work

Answers to Questions in Examinations held by the London Institute Guilds illustrate the Class of Work done by the Plumbing Trade in the Old Country.

Question 2,—A small but good class of house is assumed to be fitted up with one bath and one lavatory basin on the first floor, and two w.c.'s and one sink on the ground floor. Sketch the best kind of fittings suitable for this class of house, and describe how they should be fitted up.

Answer.—Fig. 1 shows an independent bath, to stand without an enclosure,

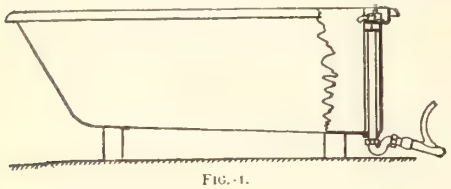


FIG. 1.

fitted with hot and cold water supply cocks and a trapped waste-pipe. If the bath is filled too full the water overflows over a standing pipe, which also acts as a waste-plug. If the bath is fixed on an upper floor and over a living room, a safe (not shown in the drawing) should be fixed on the floor.

Fig. 2 shows a section of a wash basin with a bowl and top in one piece of ware, fitted with hot and cold supply valves and a trapped waste pipe with overflow as described for the bath. The basin should be fixed on brackets secured to the wall. As there are two w.c.'s on the ground floor it may be assumed that one is for family use and the other for the use of the servants.

Fig. 3 shows the best w.c. fitted up on the sassumption that the ground floor is only a foot or so above the outside ground level. Because lead should never be buried in concrete, the w.c. trap should be made of cast iron, but the ventilation pipe above ground level can be of eithet lead or iron. A lead ventilation pipe is shown in the drawing. The appliance shown is a valve w.c. with valve and regulator for flushing the basin.

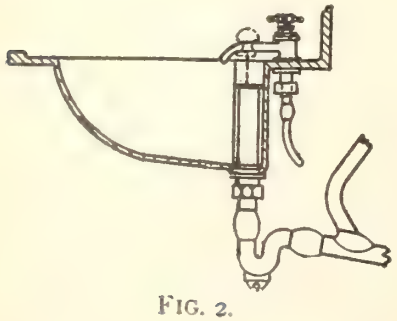


FIG. 2.

Fig. 4 shows the w.c. for the servants' use, from which a stoneware drain is fixed and continues through the wall. The floor under the w.c.'s should be: For the best w.c., marble, tiles or mosaic; and for the servants' w.c., portland cement, concrete, trowelled to a smooth surface.

Fig. 5 shows an enamelled fireclay sink, with high back, hot and cold water supply taps, grated waste outlet and trapped waste pipe. The waste-pipe is recessed in the wall under the sink to avoid being bruised by tubs or pails.

The drawing shows the methods of fitting up. The drains are shown connected to the w.c.'s. The waste-pipes from the bath, wash basin and sink should be continued to discharge into interceptor-traps situated outside the house.

Question 7.—How should the discharges for the lower ends of rainwater-pipe be conducted into the house drain; and how should the connection be made between lead soil-pipe and an iron and stoneware drain respectively? How should the soil drain be treated before it is connected to a sewer, cesspool or sewage tank. Sketch and describe the kind of traps and drain pipes that should be used, and the method of jointing, assuming that all drains are to be outside the house.

Answer.—All rainwater pipes and waste-pipes should discharge into inter-

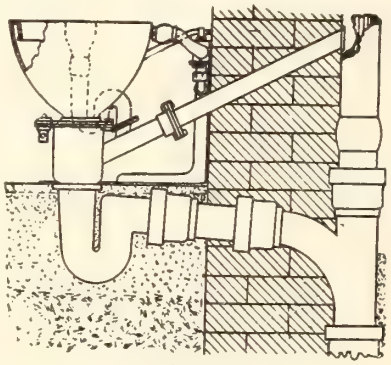


FIG. 3.

ceptor traps fixed outside the building and connected to branch drains leading to the main drain. Fig. 14 is a plan showing a waste-pipe connected to the same interceptor trap. In question 2 Fig. 3 is an elevation showing the connection of a lead soil-pipe (in the drawing referred to the pipe is intended as a ventilator to the drain from the w.c.) to an iron drain. Fig. 15 shows the connection of a lead soil-pipe to a stoneware drain.

In answer to the second question, the soil drain should have an access chamber with an open channel and a disconnecting trap in the bottom and either an open grating or an air-tight manhole over at the ground surface level, according to circumstances. If an air-tight cover is fixed, special provision should be made for the entry of fresh air into the drains and to pass through them and up the soil-pipe or the drain ventilator pipe.

So as to keep the answer to the question as far as possible within the scope of the ordinary grade, syllabas only the trap and channel are shown by Fig. 16. Fig. 17 is a side view of the interceptor trap of which Fig. 14 is the plan. The side inlet, however, should be on the other side of the trap. Because it is mentioned are to be outside the house, it may be assumed that stoneware drains are intended to be dealt with in the answer. Fig. 15 also shows a joint in a stoneware drain, half being shown in section and half in elevation.

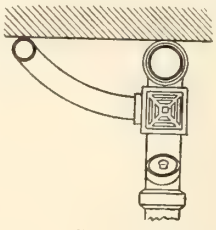


FIG 14

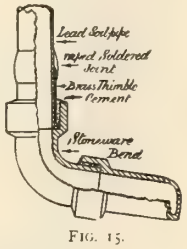


FIG. 15.

A NEW METAL.

A new metal called hydeslite is being produced by the Hydeslite Metal Company, Philadelphia. It consists of an amalgamation of various minerals and when mixed with brass it imparts to it extraordinary strength. While common brass will crumble when exposed to great heat, experiments show that when mixed with hydeslite it will bend or roll hot, neither breaking nor crumbling. Philadelphia manufacturers of goods requiring brass finish are taking so kindly to the new metal that the company are arranging to enlarge greatly the capacity of its plant.

SHREWD ESTIMATES.

If Niagara Falls were composed of beer instead of water it would fill a stein holding 25,234,720,000 quarts every hour. A man, to lift and drink this stein, would need be 353,186,080,211 feet tall. A man of Pete Jessimane's capacity could drink an hour's flow of the falls in 1,097,161,739 days, 2 hours and 52 minutes. Allowing that it takes

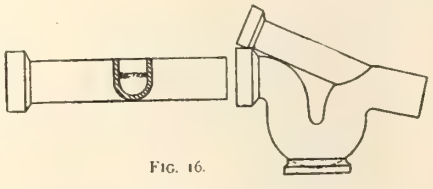


FIG. 16.

14 steins to make a man tight on beer and 18 to get him spifflicated, an hour's flow of the falls would keep the entire Aryan race spifflicated for two days, and make the entire Mongolian race tight for a week. The calculations are based on the supposition that the beer would be drawn solid and that the foam would be in proportion to the mist rising above the falls.

AGREEMENTS WITH APPRENTICES

As the apprentice problem is ever an important one with the master plumbers and fitters the subject will, undoubtly receive and deserve attention at the coming convention of the National Plumbers' Association at Montreal.

At the recent spring meeting of the National Machine Tool Builders' Association, E. Payson Bullard, of the Bullard Machine Tool Company, Bridgeport, Conn., chairman of the committee on apprenticeship, submitted a report recommending among other things the adoption of a uniform system of agreement between employers and parents or guardians of the apprentices, and that a certain amount of the apprentice's wages be held by the employer as a surety for the good conduct of the employe. It also suggested the adoption of a diploma signed by the officers of the National Machine Tool Builders' Association to be presented at the completion of a satisfactory apprenticeship. Mr. Eberhardt declared that under the New Jersey law an employer has no right to retain any part of the employe's salary, and he recommended that in adopting a form of agreement it be specified that the employe pay from his wages the amount to be held by the employer as a guarantee. He added that, instead of making a mere formality of the rule, employers insist on the money passing from the apprentice to the employer, in order to inculcate in both the mind of both the apprentice and his parent or guardian the understanding that the employer means to deal fairly with the boy.

Mr. Bullard advised that apprentices be paid a graduated scale according to the skill required in the work and the pay that a journeyman receives in the departments to which the boys are apprenticed. He called attention to the fact that employers would profit through the presentation of a formal diploma to apprentices, as they would be able to give preference to men presenting diplomas from shops which they knew turned out skilled mechanics. Mr. Bullard added that apprentices should be carefully instructed, and in this respect an employer should see that they were properly dealt with.

The report submitted by the apprenticeship committee, contained forms of apprenticeship agreements and drafts of terms to be entered into between employers and apprentices. The report was based on replies from members of the association to a list of questions sent them as to their experience in indenturing apprentices. The terms of apprenticeship and forms of agreements recommended are as follows :

Terms of Regular Apprenticeship.

to

....

of

....

1. Application must be made in person. When satisfactory the applicant's name will be registered and due notice given when he is required to commence work. Applicant must be at least 17 years of age.

2. The applicant must, before commencing work, execute, together with some responsible surety, an agreement in the form hereto annexed.

3. A trial period of 1,000 hours will first be required, after which, should the apprenticee prove satisfartory, he will begin his term of service, which will be three years of 2,900 hours each.

4. If during this period of trial an apprentice should, in the opinion of said company, prove deficient in capacity or unsatisfactory in deportment, notice to that effect shall be given to said apprentice and his surety and the contract of apprenticeship shall become absolutely void.

5. On completion of the trial period the apprentice will be given the use of a new equipment of tools, which will be the property of the company ; but on satisfactory completion of the term of apprenticeship said equipment of tools will be given to the apprentice free of charge.

6. The wages of apprentices shall be as follows : For the first 1,000 hours, or period of trial, and the first year, 8 cents per hour ; for the second and third years thereafter, 10 and 13 cents per hour, respectively, will be paid.

7. Wages will be paid on the regular pay days of the company as they may, from time to time, be established, except that the money earned during the trial period will be retained by the company until the apprentice shall have completed his term of service, when he will be paid that amount, unless it shall be forfeited, as otherwise herein provided.

8. Lost time shall be made up at the expiration of each year, at the rate of wages paid during said year, and no year of service shall commence till after all lost time by the apprentice in the preceding year shall have been fully made up.

9. It is also expressly understood and agreed that at any time when from any cause whatsoever orders shall fall off, making it necessary to shorten the hours of labor or close the works or department, the said company reserves the right to suspend the force of apprentices wholly or in part, making payment only for the time actually worked.

10. The company will faithfully instruct the apprentice in the machinists' art or trade in their shop in ..... during his said term of apprenticeship

11. Applicants who may have served terms of special apprenticeship, or who may be graduates of technical schools, shall be entitled to such credit of time on period of service as regular apprentices, and an increase in wage rates as may be mutually agreed upon.

12. Apprentices will be required to perform their duties with punctuality, fidelity and diligence, and to conform to the rules and regulations which are or may be adopted from time to time for the good government of the shop ; and the company reserves to itself the right, at its sole discretion, to terminate the agreement and discharge an apprentice from further service, for any unfaithfulness, nonconformity with such rules and regulations, want of diligence to his business, or improper conduct in or out of the shop. In case of such discharge, or in the event that said apprentice shall abandon his apprenticeship before the expiration thereof, without the consent of said company, the apprentice shall forfeit all wages then earned and unpaid,, together with the money earned during the period of trial, retained by the company as a guarantee of good faith.

Agreement—Regular Apprenticeship.

I. This agreement is made and entered into this ..... day of ....., 19....., by and between ..... a corporation located and doing business in the city of ....., State of ....., hereinafter known as the "Company"; and ..... of ....., hereinafter known as the "Apprentice"; and ..... of ....., hereinafter known as the "Surety."

II. For the purpose of acquiring the art or trade of machinist ..... hereby becomes the apprentice to the company and the company hereby accept said ..... as an apprentice in the art and trade of machinist ; each party in accordance with and subject to the "Terms of Apprenticeship" hereto annexed and made a part hereof.

III. And the said ....., as surety, hereby guarantees that the said apprentice shall well and truly conform with and abide by all the provisions of said "Terms of Apprenticeship," and shall in no wise violate any of its provisions, and that said apprentice shall not abandon said apprenticeship before the expiration thereof.

IV. And it is fully understood and agreed by the said apprentice and his surety that the company shall have the right at any time to discharge said apprentice for unfaithfulness and noncompliance with the rules and regulations of the shop, want of diligence, indifference to business, or improper conduct either in or out of the shop. In event of such discharge, or should the said apprentice abandon such apprenticeship before the expirasion thereof without the consent of the company, all wages then earned and unpaid, together with the money earned during the period ,of trial, and retained by the company as guarantee, shall be forfeited.

V. It is further agreed by said company that in the event that said apprentice shall remain its apprentice during the full term of apprenticeship (including the making up of lost time), and shall in all respects comply with the provisions of the "Terms of Apprenticeship" hereto annexed, to present said apprentice with the equipment of tools, the sum of ..... dollars, which was earned during the trial period, together with the diploma bearing the seal of the National Machine Tool Builders' Association.

In witness whereof the three parties to this agreement made in triplicate, hereto set their hands and seals, the day and year first above written.

TOILET COMBINATION.

W. J. Minns, New York City, has invented and patented a combination of sink, bath and wash tub. The purpose of the inventor is to provide a structure especially adapted for use in a small flat, tenement or apartment house, where there is little available room for necessary single plumbing and wherein in a single article will be combined a sink, bath and wash tub, each adaptation being as perfect and as convenient for use as a series of equivalent independent devices.

NEWS OF THE TRADE IN CANADA

Houseon & Cope, plumbers, Okotoks, Alta., have dissolved.

Niagara Falls, Ont., will spend $35,000 on waterworks extension.

Five Government telephone lines are being erected in Alberta.

The estate of F. Boal, Winnipeg, is advertising a plumbing stock for sale.

W. Field has opened a hardware and plumbing business at 702 College street, Toronto.

Andrew Farrell, lately appointed sewerage and plumbing inspector at Fredericton, N.B., has resigned.

The Paul Automatic Gas Co., Montreal, have removed from St. Catherine St. East to 50 St. James St.

The Metropolitan Incandescent Supply Company, Montreal, manufacturers of gas mantles, etc., have dissolved.

Elliott Bros., Kingston, have secured the plumbing contract for the new Biological building at the Queen's University.

The plumbing firm of Whiddon & Woodgate, Fort William West, Ont., have been succeeded by A. L. Woodgate & Co.

William Knight, representing the Amherst Foundry Co., of Amherst, N.S., was calling on the trade in Montreal last week.

The Vanstone Heating and Plumbing Co. now conduct two establishments, one in Vancouver and the other in New Westminster.

Charles Nurse and Chesley Austin, plumbers, St. John's, Nfld., have dissolved partnership, Chesley Austin retiring from the firm.

Palmer & Ireland, plumbers, Brantford, have dissolved partnership. The business will be carried on under the firm name of J. D. Palmer & Co.

Harley Montgomery, aged 18, an electrician's helper, employed by Bennett & Wright, Toronto, was killed on July 10 by falling down an elevator shaft.

Louis G. Wilmot and George Sabourin have been registered to carry on a plumbing business in Montreal under the firm name of Wilmot & Sabourin.

Jas. H. Doody, St. John, N.B., has secured the plumbing and heating contract for a new school building being erected in that city. The price was $7,990.

Ban & Anderson, Vancouver, are enlarging their plumbing shop and equipping it with more up-to-date machinery. They make a specialty of high-class ship plumbing.

John Meehan and Anthony J. Showers have been registered to carry on the business of electricians and plumbers in Montreal under the firm name of Meehan & Showers.

Robt. J. McKelvey, of the firm of McKelvey & Birch, Kingston, who has been ill for the past few weeks, is spending his summer holidays at St. Agathe, with his wife and family.

J. J. Sheridan, of Woodstock, is going out of the plumbing business and will shortly move to Toronto. Mr. Sheridan has accepted a position with the Bennett & Wright Co., Toronto.

Improvements, costing in the neighborhood of $7,000, have been decided upon by the management of St. Joseph's hospital, Guelph, including the installation of a steam heating plant in place of the hot water system now in use.

James P. Feely, Jr., until recently assistant secretary, has been elected a director of the Ideal Manufacturing Co., Detroit, as well as secretary of the company, with which he has been so long identified in different capacities.

John Lewis & Co., Belleville, have secured the contracts for heating and plumbing work on the new House of Refuge, Standard Bank and public library at Belleville, and Mathers' Block at Stirling.

Sixteen union brass molders employed by the Labatt Manufacturing Company, quit work on July 10 because, they allege, the company employed a man in the molding shop who was at one time a strike-breaker for a local iron foundry.

A salesmen's club has been organized in Detroit to be known as the Detroit Salesmen's Club and composed of the commercial salesmen for plumbing and steamfitting houses. It is planned to have a meeting hall and a suite of club rooms for the use of the salesmen and their customers. The purpose of the organization is both social and commercial. The membership is to be limited to 100.

The contract for the erection of the Wolverine Brass Co's plant at Chatham, Ont., has been signed, John Piggott & Sons being the contractors. Building operations are to be commenced this week, the contracts calling for the completion of the factory by November 20 next. The main building will be three storeys in height, and 50x100 feet in ground dimensions, while the boiler room will be 20x20 feet, and the foundry 38x72 feet. The front will be of pressed brick, and the grounds adorned with trees and flowers. The site is one that gives the company admirable shipping facilities, the C.W. & L.E. being right at its doors.

PLUMBING AND HEATING MARKETS

MONTREAL PLUMBING MARKETS.

Montreal, July 23.—Activity in local plumbing circles is maintained splendidly. A lull is generally looked for at this period of the year, but so far the exception has been the case. Every manufacturer is busy, large orders are arriving steadily, and, with exception of slashed prices on enamelware, soil pipe and fittings, trade conditions are very satisfactory.

Through the Iron Age (July 11) it is made known that American soil pipe and fittings manufacturers have revised their price lists as adopted May 24, 1907. The revision has in many cases involved slight advances. It is the intention of Canadian manufacturers of the same commodities in the near future to re-adjust their prices. The readjustment will not necessarily involve any advances. It will be interesting to note the new and old prices on cast iron pipe and fittings, as adopted by American makers. The following are quotations of new and old prices, respectively, on standard weights of soil pipe, (single hub) : 2-inch, per foot, new, 26c.; old, 24c.; 4-inch, per foot, new, 42c.; old, 40c.; 6-in, per foot, new, 75c.; old, 70c.; (double hub) : 2-inch, per foot, new, 32c.; old, 30c.; 4-inch, per foot, new, 48c.; old, 46c.; 6-inch, per foot, new, 90c.; old, 85c. Corresponding differences occur in prices on fittings. On bends from quarter to sixteenth the prices on standard weight are : 2-inch., new, 45c.; old, 40c.; 4-inch, new, $1 ; old, 80c.; 6-inch, new, $2.25; old, $2.

Lead Pipe—The recent advance made, whereby prices are now net list, is well maintained. A strong demand exists, with adequate supplies; lead pipe, 7c.; lead waste, 8c., net list.

Iron Pipe—Owing to the increased cost of raw material caused by a large diminution in the supplies, another advance has been made in the cost of finished products. We now quote 1-2-inch black at $2.89 ; galvanized, $3.90 ; 1-in. black, $5.60 ; galvanized, $7.26.

Brass Goods—A heavy demand prevails for all lines. Supplies, however, are limited. Prices are very stiff. Manufacturers are able to meet with only a fraction of the demand.

Enamelware—A steady volume of business is being transacted. Competition is very keen and prices are necessarily low. It will not be long before the makers of this line realize the folly of their ways and come to some satisfactory agreement. Enamelled closets and urinals are still quoted at a discount of 15 per cent.

Soil Pipe and Fittings—Business is good. As the manufacturers worked steadily last winter good supplies are on hand and are quite adequate to the demand. Medium and extra heavy pipe and fittings up to 6-inch, 60 and 10 to 70 per cent.; 7 and 8-inch pipe, 40 and 5 per cent.; light pipe, 50 per cent.; fittings, 50 and 10 per cent.

Cast Iron Fittings—The discount is still 57½ per cent. Demand is steady.

Solder—Half-and-half guaranteed bar solder is still quoted at 25 cents per pound ; wiping, 22 cents.

Metals—The market at present is quiet. Ingot copper is still weak, and much uncertainty rules in the local market. We continue to quote at $23.50. Lead is firm at $5.75 for bar. Pig iron is steady, with a fair tonnage going through Middlesboro, No. 1, $21.50 ; No. 2, $20,50 ; Summerlee, $25.50. Old materials are very dull. Little demand prevails, and prices are weak : Heavy copper and wire, 17c.; light copper, 16c; heavy red brass, 15¼c.; heavy yellow brass, 12c.; light brass, 8½c.; heavy lead, 4c.; scrap zinc, 3¾c.; No. 1 wrought iron, $15.50 ; No. 2, $6.

TORONTO PLUMBING MARKETS.

Toronto, July 22.—General activity prevails in all lines of plumbing supplies and local jobbers are unusually busy for this time in July. The local plumbers' and steamfitters' strike, which has now been on for ten weeks, is not affecting trade to the extent that an outsider might suppose. Between non-

union men and the two hundred union men who have received permits to work, local jobbing contracts are fairly well attended to and the majority of customers are showing a disposition to hold back new work, as far as possible, until a settlement of the difficulty can be arrived at. Meanwhile, jobbers are kept busy attending to outside business, which is exceptionally large this year on account of the phenomenal building activity which prevails all over the Dominion.

Iron Pipe — The advance predicted in the last issue of Plumber and Steamfitter has now gone into effect. A great scarcity exists in the smaller sizes and delivery from the mills is slow and uncertain. Sizes one-quarter and three-eighths are exceedingly limited, while the popular plumbers' size, one-half inch galvanized, at present is almost a negative quantity. According to the new price, ½-inch black pipe is quoted at $2.90 and ½-inch galvanized at $3.75; 1-inch black pipe is held at $5.60 and 1-inch galvanized at $7.25.

Soil Pipe — A fair business is being done, but local trade in this line is slightly retarded by the plumbers' strike. Supplies are well up with the demand, and prices are still unchanged: Medium and extra heavy pipe and fittings, up to 6-inch, 70 per cent.; 7 and 8-inch pipe, 40 and 5 per cent.; light pipe, 50 per cent.; fittings, 50 and 10 per cent.

Solder and Lead Pipe — Solder is in good demand with no change in price. Wiping solder is still held at 23c. per pound. There has been no further change in the price of lead pipe and waste since the recent advance, and net list is still the figure at which these are held.

Compression Work, etc. — Compression work remains at 57½ per cent., and Fuller work at 65 per cent. off list. Ground work is quoted as follows: Bibbs, 45 per cent.; roundway work, 50 per cent., and flatway work, 55 per cent. off list.

Cast Iron Fittings — Prices are firm at 57½ per cent., and a good business is being transacted.

Enamelware — Continues to be in strong demand, with the January price list still in vogue. Price cutting has evidently ceased for the present, but a few buyers still hold back their orders as long as possible, as if doubting the jobbers' sincerity in this matter.

Metals — Casting ingot copper has declined ½c. per pound and is now quoted locally at 23c. The recent break in the American market has been reflected here, and we should not be surprised if the market should decline still further, bringing about a consequent decline in brass goods. Lead is in fair demand and supplies are quite adequate; lead continues easy on the London market and prices are very weak in the United States. Iron and steel are quiet at present. Both American and English quotations are easier, but this has not yet affected the local market. Generally speaking, the market for old materials is dull. The price on heavy copper and copper wire scrap has declined ½c. per pound, and these are now quoted at 18c. Prices on machinery scrap and stove plate are unchanged since the recent decline.

TORONTO JOURNEYMEN'S STATEMENT.

Editor Plumber and Steamfitter :

Sir,—The strained relations existing between the Master Plumbers' Association, (which is a sub-section of the Employers' Association), and Local Union, No. 46, of Journeymen Plumbers, Gasfitters and Steamfitters, of Toronto, which has resulted in a practical cessation from work by the members of the union, commencing on May 15 last, and which still continues, is a practical example of the ease with which a fight can be started and continued. With your permission, I would like to give a short history of the dealings of the union with the Master Plumbers' Association during the past eight years, in the matter of agreements, etc.

For several years prior to the year 1899 the trade was blessed, or otherwise, with open shops and a nominal minimum rate of wages of 25 cents per hour. The cost of living, (which for some time previous had been comparatively low) was rapidly increasing, in consequence of which the members of the union, wishing to secure an income more nearly in keeping with their expenses, asked that the minimum rate be increased to 27½ cents per hour. The employers, after several conferences, agreed to an actual minimum of 25 cents, with an increase of 2½ cents per hour to those who were then receiving 25 cents or over. Since that time agreements have been reached whenever a difference arose between the two associations, by conferences being held by joint committees representing the two organizations, and in every case a settlement has been reached by mutual concessions being made in order that an agreement might be arrived at. Each agreement has dealt with the following matters : Wages, hours of labor, overtime, traveling expenses, apprentices, etc. Neither time nor space will admit of any lengthened remarks on the various questions involved in the present disagreement. One clause, however, I would like to refer to, at present, (other matters I may, with your permission, take up at a later date). Clause 9 of the agreement reached on May 14, 1906, reads as follows :

"This agreement shall take effect on May 14, 1906, and shall remain in force from that date until May 14, 1907, and should either party to this agreement wish to change, add to or amend the above, they shall give at least three months' notice in writing prior to the termination of this agreement, and providing no notice is given by either party prior to May 14, 1907, this agreement to continue in force from year to year until such notice is given, as herein provided ; when such notice has been served to either party it shall be the duty of the joint committee to convene within one month of the date of such notice."

On February 12, 1907, the union gave the required three months' notice of its desire to amend the agreement. No reply of any kind was received from the M.P.A. until May 2, when a communication was received, not from the secretary of the Master Plumbers' Association, but from J. G. Merrick, secretary of the Employers' Association, laying down a platform which we could not possibly accept. Mr. Merrick was, however, notified that a committee from the union had been appointed and would meet their committee if so desired. A meeting was arranged and held. When the committee from the union expressed the wish to consider the agreement, seratim, in order that an understanding might be arrived at, they were met with the statement that we must accept the ultimatum of the Employers' Association in its entirety. Our committee, very properly, declined to agree, and so negotiations ceased, resulting in temporary financial loss to both of the parties immediately interested, with probable permanent loss to the members of the M.P.A., by reason of work being transferred from their establishments to those employers who are not members of the association, and who have recognized the justice of the union's contentions by signing their agreement, thus placing themselves in a position to command the services of as many journeymen as they require to perform the work that is pouring into their hands.

Of course, the members of the Master Plumbers' Association ought to know whether they are satisfied so far, or not. On behalf of Local Union, No. 46, I would say that we are prepared to prosecute the fight that has been forced on us, for a long time to come.

Yours, etc.,

JAS. RICHARDS,

Toronto, July 22, 1907.

BUFFALO PLUMBERS COMING.

A big jollification is being arranged by the Toronto master plumbers for Friday, July 26, when the Buffalo masters come over to fraternize with their Toronto brethern. The event will be pulled off at Toronto Island, and all who attended the good times at Grand Island last year or at Toronto Island two years ago will not miss the present opportunity. Visitors from other cities are also invited.

A CANADIAN BRANCH.

Their increasing business in Canada and a desire to handle their business to better advantage has justified the Ruud Manufacturing Company, Pittsburgh, manufacturers of automatic hot water heaters, to make arrangements to manufacture them here. Premises have been secured at 155 King street west, Toronto, admirably suited for manufacturing purposes. They are to be equipped with the necessary machinery, and to be in operation at an early date. The plant will supply all of the Canadian trade, and will be in charge of Geo. Hobbs, general manager, Orlando Vickery, 178 Victoria street, retaining the sales agency for Ontario. This company is now operating a factory at Hamburg, Germany, which supplies England, Germany and Russia, but their Edwin Ruud, vice-president, is now in Europe. and while at Paris will arrange for the establishing of a plant there to supply all of southern Europe.

Jardine Hand Drills

New Designs

Get samples of these machines for your show room. They will interest your customers and prove a good investment.

It pays to sell the best Tools.

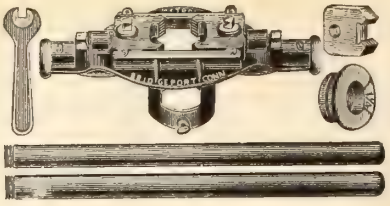
A. B. JARDINE & CO.
HESPELER - - - ONTARIO

...FULL STOCK...

Salt Glazed Vitrified

Double Strength Culvert Pipe a Specialty.

THE CANADIAN SEWER PIPE CO.
HAMILTON, ONT. TORONTO, ONT.
ST. JOHNS, QUE.



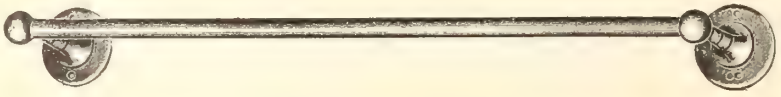
The Armstrong Manufacturing Co.

317 Knowlton St., - Bridgeport, Conn.

Manufacturers of the Genuine Armstrong Stock and Die, Malleable Iron Hinged Vises, Pipe Cutters, Pipe Wrenches, Bard Adjustable Bushings, Ratchet Attachment for Stock, Pipe Threading and Cutting-off Machine--Hand and Power. Our goods are sold by all Jobbers.

CATALOGUE MAILED ON REQUEST

High-grade Bathroom Fixtures



ARE MADE IN CANADA BY

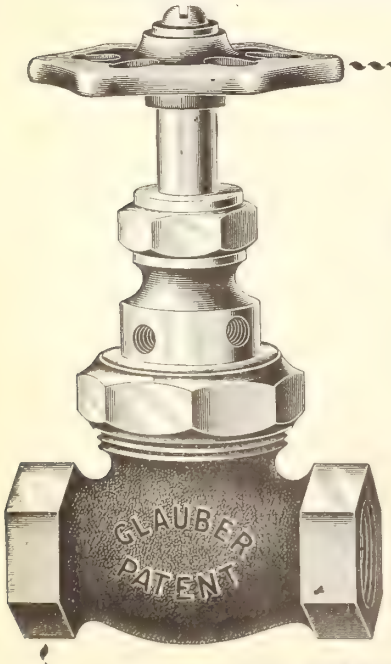
The Carriage Mountings Co., Limited, Toronto

No. 30 King, Price, each $5.20 net.

HOTTEST ON EARTH

We manufacture the largest line of mechanical tools using gasoline, kerosene and alcohol as fuel. Your jobber will supply you at factory prices. Guaranteed to please you or money refunded.

THE TURNER BRASS WORKS
53 MICHICAN STREET, - CHICAGO, U.S.A.



Automatic

SELF DRAINING COMPRESSING

STOP AND WASTE COCK

The Only Self Draining Cock Made

Patent Features, Two holes in bonnet—Upper hole for air—Lower hole for waste—insures perfect circulation and automatic drain, no matter in what position cock is installed.

Interchangeable right or left. Quick operating stem. Made to stand Boiling Water as well as Cold.

GLAUBER FIVE YEAR GUARANTEE PROTECTS YOU

A Trial Dozen Will Make You Order More

CLEVELAND, **GLAUBER BRASS MFG. CO.** OHIO

If you can use High-grade Low Down Compression Basin Cocks with China Index Handles, ask for the Acme Brass Works Nos. 4, 5, 6 and 7 Basin Cocks, which are just what you want. They are the acme of perfection in style, workmanship and durability.

Write us to-day.
Do not delay for to-morrow.

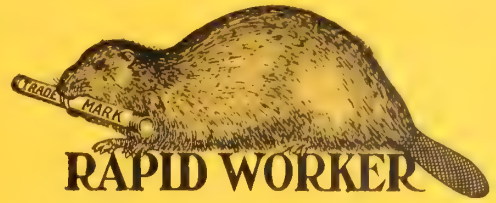
Acme Brass Works

CLEVELAND, O.

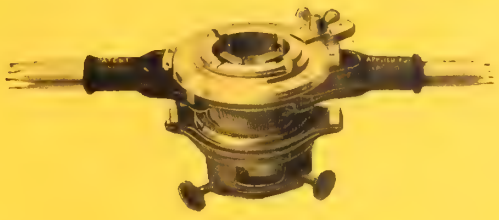
Let Our Beaver Do Your Work.

You Don't Have to Change Dies.

Cuts 1, 1¼, 1½ and 2" perfect threads, all with one set of chasers



RAPID WORKER



The Hand Stock that Starts Easy and Finishes Easier.

"The New Way."

You Will Find it a Sure-enough Beaver.

Write for our special 10-day trial offer

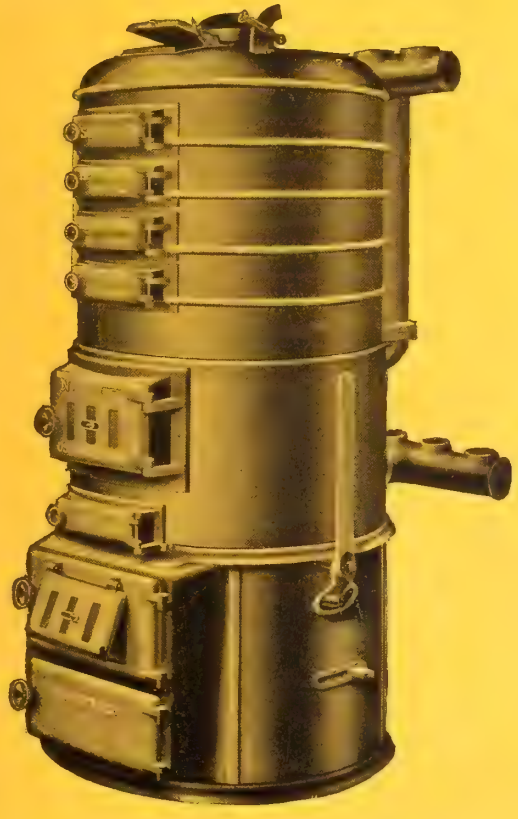
You cannot afford to take the time to thread pipe by hand in any other way

Other sizes of Beavers will be born soon—¼ to ¾—2½ to 4—4½ to 8—8 to 12.

Manufactured by

Borden-Canadian Company

166 Adelaide Street West, Toronto



Manufacturers who claim perfection for their wares are aplenty. We let the practical men of Canada—**the men who know**—make all the claims which we print regarding the

"SOVEREIGN" BOILER

They—**the men who know**—declare that the Sovereign Boiler is just as near perfect as human ingenuity can make a boiler, and add that it is the nucleus of as perfect a heating system as ever devised by man.

Remember—practical men—men who know the virtues of **The Sovereign System** and reaped the profits—say so. The inference is plain.

Taylor-Forbes Company,

LIMITED

Head Office and Works: GUELPH, ONT.

TORONTO—1088 King St. West. MONTREAL—122 Craig St. West
WINNIPEG—The Vulcan Iron Works, Limited

Free Advertisement Cuts and Copy for Plumbers

Look below at the sample advertisement of ***Standard Ideal Porcelain Enameled Ware*** and consider if it would help you in your business. We supply plumbers who recognize the merit of ***Standard Ideal Porcelain Enameled Ware*** with advertising CUTS AND COPY FREE.

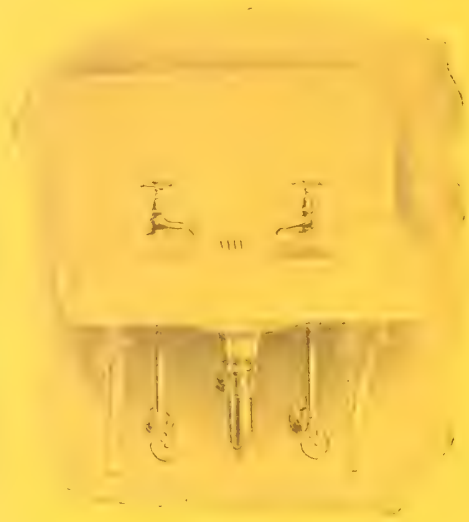
If you like the sample on the right, a word from you to us and we will send you what copy and cuts you want —free.

The Standard Ideal Co., Limited,

Port Hope,

Ont.

Nowhere Does Perfect Work Count More



than in the sanitary equipment of a modern house. Poor plumbing is synonymous with loss of health, loss of comfort, loss of savings, loss of property values.

"STANDARD IDEAL" PORCELAIN ENAMELED WARE

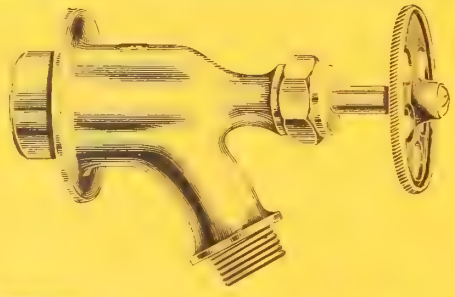
installed in the bedroom, bathroom, kitchen, or laundry guarantees health for the family and adds to the cash value of the home.

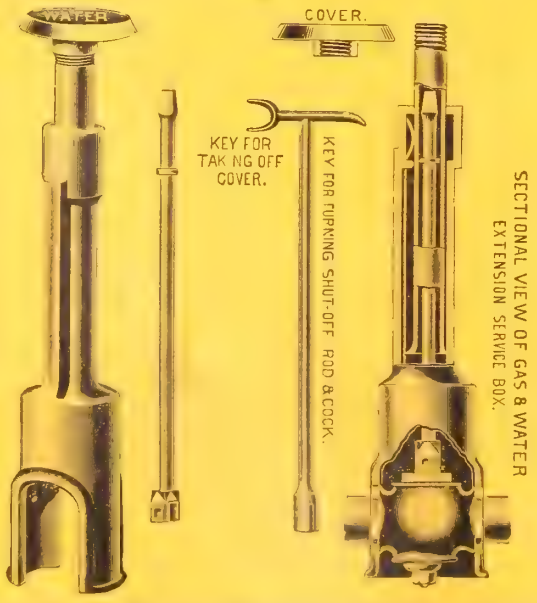
Moderate in first cost, it soon pays for itself and becomes a valuable asset.

Let us instal it in your home.

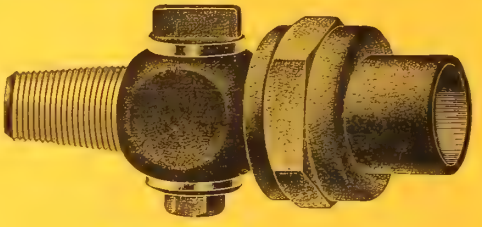
JOHN BLANK & CO.,

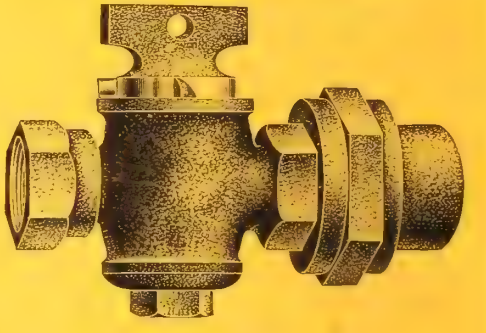
Plumbers and Steamfitters





Fittings That Don't Disappoint





For

Plumbing, Water, Gas and Steam

Hays Manufacturing Co.

Complete Works: - - - ERIE, PA., U.S.A

PLUMBER & STEAMFITTER OF CANADA

THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

MONTREAL, 232 McGill St. TORONTO, 10 Front St. E. WINNIPEG, 511 Union Bank Bldg. LONDON, ENG., 88 Fleet St. E.C.

Vol. I. No. 9. (New Series). Publication Office : 10 Front St. East, TORONTO, AUG. 14, 1907. Old Series, Vol. XIX. No. 19

Nothing is too good for a good Job

Plate 556E.—China Base, Handle and Index Top.

Plate 557E.—China Handle and Index Top.

Brass Goods are Important on any Job.

WE HANDLE THE BEST

Prompt Delivery

SOMERVILLE LIMITED

59 Richmond St. East, TORONTO

ROBERTSON'S MARBLE LAVATORIES

In addition to the goods illustrated, we manufacture and carry in stock a full line of staples, such as Brass Compression, Fuller and Ground Work, Soil Pipe and Fittings, Iron Pipe and Fittings, Engineers', Gasfitters', Steamfitters' and Mill Supplies. A Catalogue for each of these departments will be cheerfully forwarded on application.

The James Robertson Company, Limited

265 King Street West, TORONTO

Plate 558E.—Push Button Self-closing Faucet; China Index Top

Plumbers' Brass Work

ALL THE LATEST STYLES PROMPT DELIVERY

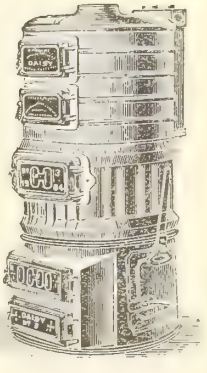
SOMERVILLE LIMITED

59 RICHMOND STREET EAST - TORONTO

The DAISY Boilers

are built according to the requirements of the most correct and scientific principles. The circulation is positive and rapid. There is more grate and fire surface than seems necessary to carry the listed ratings.

But it is just such business practice that has made the DAISY the most popular boiler in Canada, and has created a greater demand than all other makes combined.



CLUFF BROTHERS

Lombard Street, TORONTO

Selling Agents for WARDEN KING & SON, Limited

Monarch is "King."

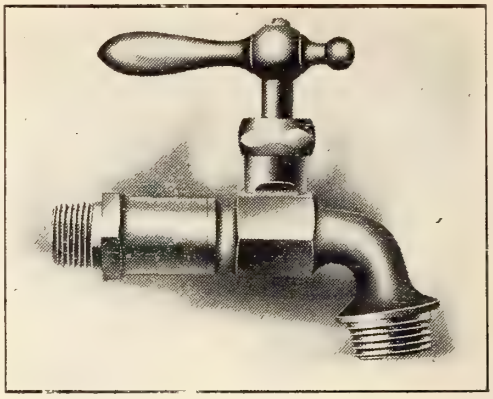
STOP

and think, are you doing

RIGHT

by your customers if you do not

NOW



Use The "Monarch Cocks"

Natty in Appearance. **Perfect in Workmanship**

LOOK WEAR **WELL**

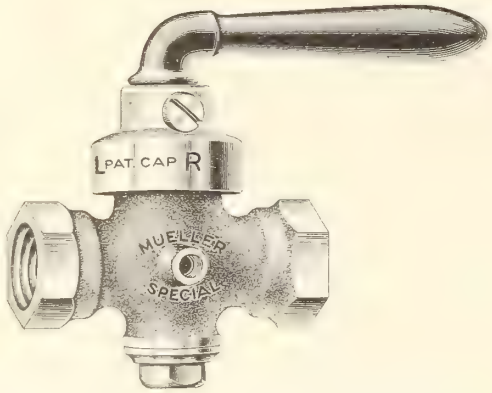
COMPRESSION FULLER **WORK**

QUICK OPENING **VALVES**

The Monarch Brass Manufacturing Co., Limited

Factory: Port Colborne, - Ont.

Office and Warehouse: 278 Dundas St., - Toronto



These goods are made in all styles of pipe connection, all sizes and with Emameled Iron Lever Handles or Galvanized Malleable Iron Tee Handles. Only the best red brass is used, and each cock is tested with 200 pounds hydraulic pressure.

Every Plumber Wants to do Good Work

If he will add to his mechanical skill goods of Quality, he will succeed in his desire and have satisfied customers as well. We have the means to this end in our complete line of

Mueller Patent Cap Stop and Waste Cocks

The patent cap protects the ground surfaces from all foreign substances, and keeps the cock in perfect working condition all the time. Interchangeable from right to left by a quarter turn of the cap.

Write for Prices and Literature

TRADE MARK MUELLER REGISTERED

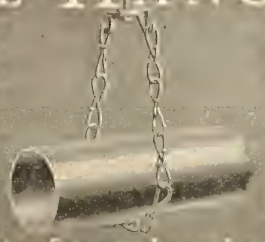
H. MUELLER MFG. CO.

Works and General Offices
DECATUR, ILL.
West Cerro Gordo Street

Eastern Division
NEW YORK CITY
254 Canal St., cor. Lafayette.

NIAGARA CHAIN for PIPE HANGING

Most convenient and neatest as well as the most economical hanger on the market.

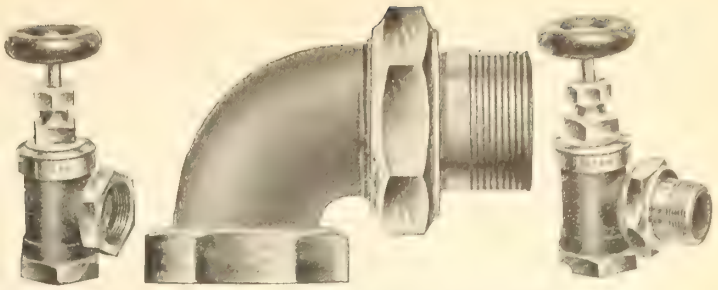


Pipe may be hung any distance from ceiling with this hanger.

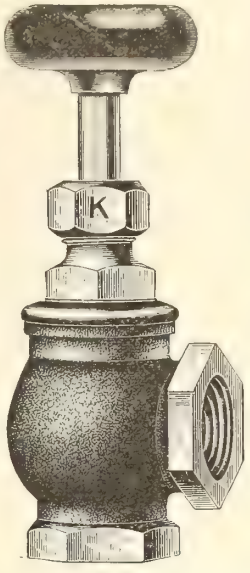
Permits of easy and exact adjustment.

Write for samples and prices.

ONEIDA COMMUNITY, Ltd.
NIAGARA FALLS, ONTARIO.



Steam & Hot Water Fitters



who handle KERR VALVES are the leading men in their line.

You should use Kerr valves for they improve your reputation for high-class work.

Made by a long established and responsible firm.

WRITE FOR CATALOG

THE KERR ENGINE CO.
Valve Manufacturers
LIMITED
WALKERVILLE, ONT.

Backed by a Guarantee

All our **Bronze** Powders and **Liquids** have the distinction of being **Guaranteed.** All plumbers and steamfitters know the necessity of having the **Best** in Bronze Powders and Liquids.

OURS NEVER FAIL

The Canadian Bronze Powder Works
MONTREAL—TORONTO
No order too large Works at Valleyfield
If your nearest dealer does not keep our goods, write us.

PLUMBERS' BOOKS

PRACTICAL HOT WATER HEATING, STEAM AND GAS FITTING, ACETYLENE GAS, HOW GENERATED, HOW USED.

PRICE, $1.50.

Illustrated.

Showing the latest and most approved Devices used, the value of Acetylene Gas as an Illuminant Discussed from Various Points of View; Every Class of Generator Described; Gas Burners and Piping; also the Best and Quickest Methods of doing Hot Water Heating, Steam and Gas Fitting, up to the Present Date.

By
JAMES J. LAWLER
and
GEORGE S. HANCHETT, S.B., M.A.I.E.E.

Addenda.

Complete Steam One-pipe Circuit System, A (insert); New Special Hot water Distributing Fitting; Soft Coal Steam and Hot-water Heater, A.

HINTS TO PLUMBERS

on

Joint Wiping, Pipe Bending and Lead Burning

By
JOHN W. HART, R.P.C.

Third Edition, Revised and Corrected.
184 Illustrations, 313 pp.

PRICE, $1.50.

Contents.

Pipe Bending, Square Pipe Bendings, Half-Circular Elbows, Curved Bends on Square Pipe, Bossed Bends, Curved Plinth Bends, Rain-water Shoes on Square Pipe, Curved and Angle Bends, Square Pipe Fixings, Joint-wiping, Substitutes for Wiped Joints, Preparing Wiped Joints, Joint Fixings, Plumbing Irons, Use of "Touch" in Soldering, Underhand Joints, Blown and Copper Bit Joints, Branch Joints, Block Joints, Block Fixings, Astragal Joints, Pipe Fixings, Large Brance Joints, Large Underhand Joints, Solders, Autogenous Soldering or Lead Burning, Index.

SANITARY PLUMBING AND DRAINAGE

By
JOHN W. HART, R.P.C.
With 208 Illustrations, 250 pp.

PRICE, $1.50.

Contents.

Sanitary Surverys, Drain Testing, Drain Testing with Smoke, Testing Drains with Water, Drain Plugs for Testing, Sanitary Defects, Closets, Baths and Lavatories, House Drains, Manholes, Iron Soil Pipes, Lead Soil Pipes, Ventilating Pipes, Water-closets, Flushing Cisterns, Baths, Bath Fittings, Lavatories, Lavatory Fittings, Sinks, Waste Pipes, Water Supply, Ball Valves, Town House Sanitary Arrangements, Drainage, Jointing Pipes, Accessible Drains, Iron Drains, Iron Junctions.

MACLEAN PUBLISHING CO., Limited, Montreal Toronto Winnipeg

Toronto and Buffalo Masters Fraternize

Half a Hundred Visitors from Buffalo Spend a Jolly Day at Toronto on Friday, July 26

"We had a fine time and it will long be remembered," wrote William E. Long, acting secretary of the Buffalo Master Plumbers' Association to The Plumber and Steamfitter after the return of the Buffalo contingent from their visit to Toronto on Friday, July 26, when they were the guests of their brother masters of Toronto.

The annual "get together" of the master plumbers of the two cities has become a pleasant fixture in the lives of the members of the two associations, one year the rendezvous being Hanlan's Point, Toronto, and the next year Grand Island in the Niagara River, below Buffalo, being the centre of enjoyment.

This year was Toronto's turn to act as host and the Toronto masters rose to the occasion, right royally, though disorganized somewhat by the disruption of their association a year or so ago, and divided by the strike of the journeymen. Bosses who are holding out against the strikers and others who have given in to the men celebrated side by side and many friendships were renewed as a result.

Headed by the capable committee consisting of Messrs. K. J. Allison, chairman; G. H. Cooper, secretary; D. Menzies, C. E. Pickard and J. E. Fullerton, the Toronto men gathered at the ferry wharf on Friday morning and after badges were distributed, paraded to the Niagara Navigation Company's wharf. On the arrival of the boat from over the lake, ranks were again formed and led by the Highlanders' band the procession marched to a special ferry, from which the crowd moved to the athletic enclosure at the Point, where refreshments were served and a programme of games participated in.

The Buffalonians were about four dozen strong, led by a committee of J. J. Kavaney, president; Geo. D. Clucas, chairman; John B. Green, secretary; Harry J. Miller, director; J. J. Klein, committeeman, and W. E. Long, assistant secretary. They brought along a number of supply men for company and if the day wasn't enjoyed by them it wasn't the fault of the entertainers.

Noontime found hosts and guests gathered in the spacious refreshment parlors outside the enclosure, where a dinner fit to tempt the most fastidious was served. This part of the programme completed, a ball game was pulled off, the result being a victory for the home team by a score of 14 to 13. A series of races for fat men, thin men, full men and empty men were also pulled off during the afternoon. The island entertainment was brought to a close by a banquet, at the close of which President Kavaney, of Buffalo, in words of praise of the warm-hearted hospitality tendered his associates, tendered to President Le-

SOME FAMILIAR FACES

Committeemen George Cooper and J. E. Fullerton, Toronto, and Chairman Clucas, Buffalo, between them in the second row.

A few of the Buffalo and Toronto Master Plumbers and Supply Men on the Niagara Navigation Co's. Wharf.

grow of the Toronto Association a beautiful gold-headed cane as a slight token of their appreciation. The recipient replied in well-chosen words, predicting an early and satisfactory settlement of the troubles which have beset the trade in Toronto during the past two years.

"CHARLEY PICKARD AT THE BAT."
Trying to Keep the Crowd from Traveling the Well-Beaten Path.

The trip back to the city had as a feature, a stag dance on the ferry boat, this being followed by another parade to the Niagara wharf where a monster circle was formed and "Auld Lang Syne" sung before the boat was taken for Yankeeland.

As indicative of the feeling of the guests the following from the Buffalo correspondent of "Domestic Engineering" is interesting:

"Everyone who enjoyed the hospitality of the Toronto association is loud in his praise of the way the Buffaloites were entertained. It is a unanimous opinion among them that for genuine, open-handed hospitality the palm should be awarded the Canadians against all comers, for according to all reports the honors bestowed upon them and the lavishness with which they were entertained were such as to make every one 'sit up and take notice.' The 'Buffaloes' brought back a number of handsome prizes as tokens of their athletic prowess, together with memories of a royal good time that will live in their minds for many a day."

Making a Two Bagger.

Guests of the Day.

C. W. Fell and Jack Nachent, of W. A. Case & Sons Manufacturing Company; J. J. Metcalfe, of D. L. Hamill, and Ernest Eddy, of A. B. Penfield & Co., represented the Buffalo supply houses.

R. J. Cluff, W. J. Cluff, Phil Smith and C. B. Childs represented Cluff Bros., Toronto.

P. McMichael, Tom Worthington, E. Brewer and George Reid represented the Dominion Radiator Company, Toronto.

W. H. Meredith represented the Monarch Brass Manufacturing Co., Toronto and Port Colborne.

W. Linton represented the Standard Ideal Manufacturing Company, Port Hope.

J. Bell, Toronto, represented the Star Iron Co., Montreal.

Fred Somerville, A. G. Beer and W. J. Spence represented Somerville, Limited, Toronto.

H. S. Harwood, J. M. Owston, J. R. Foster and C. Sim represented the James Robertson Company, Toronto.

Charles World represented the James Morrison Brass Manufacturing Company, Toronto.

C. E. Oldacre represented the Gurney Foundry Company, Toronto.

E. A. Rogers represented the National Plumbing Supply Company, Toronto.

P. Hoffman represented the Canada Radiator Company, Lachine, Que.

W. B. Malcolm represented the Queen City Brass Works, Toronto.

C. G. Johnston represented the Good Manufacturing Company, Boston, Mass.

G. M. Watt, of James Watt & Son, master plumbers, Chatham, Ont., was also one of the gathering.

Weston Wrigley and W. B. Waters represented The Plumber and Steamfitter.

Notes.

Prepare for another good time at Grand Island next year.

Our photographer got lost in the shuffle, but some of the best looking are shown in our illustrations.

Pete Jessimane says his record has been broken by Charley Pickard.

Not a single incident to mar a day's happiness.

The grass between the grand stand and the refreshment room got pretty well worn.

The committee deserve to be congratulated on the success of their efforts to provide a glorious day's fun.

KEYSTONE PIPE COVERING.

H. W. Johns-Manville Co., of New York City, are issuing to the trade two small booklets, one containing "A Few Facts About Cleaning a Boiler," the other containing an illustration and description of their Keystone plumbing pipe covering. In the first booklet some very interesting information is contained regarding boiler cleaning. Everyone interested in these booklets will do well to procure copies of them from the company.

ALLEGED INTIMIDATION.

In a recent police court sitting before Magistrate Ellis, Toronto Junction, an interesting labor case came up in a charge of trespass and intimidation preferred against Alexander Kitchen and Fred. Dickson, both of Toronto, on information laid by Robert Paterson of the plumbing firm of Paterson & Co. Both the prisoners are striking plumbers, and Mr. Paterson alleged that they approached a plumber, James Jones by name, employed by him on a house being erected at the corner of Keele and Dundas streets, and tried to induce him to leave his work. Jones himself gave evidence that he had been requested to give up his job, but that the men were not abusive. The Messrs. Paterson stated in reply to questions from R. G. Agnew, the counsel for the defence, that they were not in the Employers' Association, and were not bound to fight the union. The prisoners, who pleaded not guilty, were committed for trial. They were released on their own bonds of $200 each.

"THE FIRM OF CLUFF BROS."
"Bob" and "Bill" Need No Introduction.

NEW VEGETABLE SINK.

A new vegetable sink for kitchens is being constructed with three compartments. In one the vegetables are washed; in the middle compartment they are pared; the third contains clean water into which they are tossed until enough are prepared to transfer to the cooking utensil. The sink is made of porcelain.

"SOME OF TORONTO'S YOUNG BLOOD."
C. B. Childs, Traveler; Gordon Ritchie, Sec. M.P.A.; Paul Smith, Sales Mgr. Cluff Bros., and J. Holt, of Love & Holt.

PLUMBER AND STEAMFITTER

OF CANADA

The MacLean Publishing Co.
Limited

JOHN BAYNE MacLEAN - - - President
W. L. EDMONDS - - - - Vice-President
H. T. HUNTER - - - Business Manager
WESTON WRIGLEY - - - Managing Editor

Publishers of Trade Newspapers which circulate in the Provinces of British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec Nova Scotia, New Brunswick, P. E. Island and Newfoundland

OFFICES:

MONTREAL - - - - - - 232 McGill Street
Telephone Main 1525
TORONTO - - - - - - 10 Front Street East
Telephones Main 2701 and 2702
WINNIPEG - - - - 511 Union Bank Building
Telephone 3726
LONDON, ENG. - - - - - 88 Fleet Street, E.C.
J. Meredith McKim
Telephone, Central 12960

BRANCHES:

CHICAGO, ILL. - - - - - 1001 Teutonic Bldg.
J. Roland Kay
PARIS, FRANCE - Agence Havas, 8 Place de la Bourse
MANCHESTER, ENG. - - - - 92 Market Street
ZURICH, SWITZERLAND - - - - Louis Wolf
Orell Fussli & Co.

Subscription, Canada and United States, $1.00
Published Twice Every Month
Cable Address { Adscript, London
{ Adscript, Canada

ASSOCIATION OFFICERS.

National Association of Master Plumbers, Steam and Hot Water Fitters of Canada:
Past President—A. J. Hammond, Winnipeg.
President—F. G. Johnson, Ottawa.
Vice-President—John Watson, Montreal.
Secretary—John A. Gordon, Montreal.
Treasurer—H. Mahoney, Guelph.

Provincial Vice-Presidents:—
Ontario—Ben Noble, London.
Quebec—Joseph Lamarche, Montreal.
Nova Scotia—G. A. Wooten, Halifax.
New Brunswick—D. Shea, Fredericton.
Manitoba—C. E. Gate, Winnipeg.
Alberta and Saskatchewan—E. J. Young, Calgary.
British Columbia—Bert Weeks, Vancouver.

Standing Committee Chairmen:—
Legislation—Hugh Wallace, Hamilton.
Apprenticeship—E. H. Russell, London.
Sanitary—H. A. Knox, Ottawa.
Essay—A. J. Hammond, Winnipeg.

The Annual Convention of the National Association will be held on August 21, 22 and 23, in the Plumbers' Hall, 90 St. James street, Montreal. Representatives from all parts of Canada will be present and a full attendance of the trade is important.

ANOTHER ENAMELWARE PLANT.

The Standard Sanitary Manufacturing Company, Pittsburg, are to add a Canadian factory to their already large factory equipment. Arrangements are being made to secure a foundry plant at Toronto, definite announcement of which will be made in our next issue.

THE COMING CONVENTION.

The annual convention of the National Master Plumbers' Association will be held in Plumbers' Hall, St. James street, Montreal, on Wednesday, Thursday and Friday, August, 21, 22, 23. On the first day the delegates will shoot the Lachine Rapids, and at night will attend the newly opened Bennett's Theatre. On Thursday they will drive to Longue Pointe, and to the top of the Mountain, attending a banquet at night. Friday will be business day. It is expected that all the members of the Association will attend, or make a strenuous effort to do so.

As already announced, special attention will be given to the subject of agreements with journeymen and the apprenticeship question. Both of these problems are of particular interest to all employing plumbers and fitters in the towns and cities throughout Canada, and it is important that any action taken, be the result of careful consideration and receive uniform support. Delegates from Toronto, Hamilton, London, Winnipeg, Calgary and other places where strikes have recently occurred are expected to be present.

The reports of the various committees will also bring up some important trade problems, a discussion of which will be helpful to all participating.

There is probably no class of business men who realize more than plumbers and steamfitters the benefits of associating with their fellows and exchanging ideas. This being so, it is certain that there will be a large attendance at the Montreal convention, and both from the standpoint of entertainment and trade discussion, the delegates in attendance will enjoy a profitable and pleasant visit to the Royal City.

SHOULD ORGANIZE BRANCH HERE.

The American Society of Heating and Ventilating Engineers, which held its annual convention in Milwaukee recently, a report of which is given in this issue, is an organization which is doing a valuable work for the heating trade in America.

The secretary of the society is a Canadian who has won a wide reputation amongst heating engineers in the United States, and amongst the delegates at Milwaukee this year was a delegate from Toronto. This suggests the advisability of forming a chapter of the society on this side of the line, and the Plumber and Steamfitter makes the proposal offering to answer any questions and do anything in its power to aid the practical men in the manufacturing and supply houses, and others eligible for membership to get together in an organization which will help to overcome trade differences and unite all in the practical work of extending the knowledge already possessed by the various individuals on heating and ventilating problems.

What the Master Plumbers' Association can do in the way of educating the masters on trade subjects, a chapter of the Heating and Ventilating Engineers Society can do to even better advantage for those branches of the trade nat eligible for membership in the M.P.A. In Chicago the members of the society meet monthly, and after dining together spend an evening in profitable discussion of some chosen problem.

The initiation fees are $15 and annual dues $10. Ten members can form a local chapter, and there are already two or three in Canada. Are there others interested in the work of organization? If so, a good time to get together would be at the M.P.A. convention in Montreal next week.

LEGALITY OF ASSOCIATION WORK

In discussing this subject in a recent issue, the Metal Worker makes a good point in contending that the activity of legal officials against illegal actions by combinations of men will work out to the advantage of trade associations, by helping the responsible officials in restraining the most reckless from doing things likely to bring discredit upon the organization. While the experience of associations in Canada has not been such as to encourage the spending of much money for legal advice, it cannot be denied that the advice given in the article reproduced below is both practical and timely. Our contemporary says:

"Men who have met for a decade or a quarter of a century for the purpose of co-operating for their common good have no occasion to fear in the present stage of activity on the part of prosecuting attorneys and the search for law bearing upon associated effort, that either they or their associations will suffer any permanent injury as the result of this activity. Citizenship in any country carries with it responsibilities, and a citizen may be called on to satisfy the authorities of the courts that no action of his, nor anything with which he is identified, is either an infringement upon or a violation of existing law. There is nothing to protect any citizen from arrest, but the very laws which make the arrest possible, also provide a means for him to show that the laws have no penalties which he must suffer. The same is equally true of any business firm, incorporated company or association of tradesmen. They or the members may be cited to appear before a court and defend themselves against charges which may be brought against them under the laws. It is well to remember in all cases that common sense is the basis of all law, and there is no occasion for excessive nervousness when a summons from a court is received.

"In some sections, laws which are readily demonstrated desirable and necessary, have been the occasion for activity in quarters where the framers of the law least expected any interest, and it is true that law-abiding business men have been put to considerable annoyance, embarrassment and inconvenience by the activities of some officials who are actuated by a desire to make a re-

cord for themselves, rather than to accomplish any good or to protect the interests which contribute to their salaries. The effect of these activities has already discouraged some men from continuing that service to their various associations, which is most needed for the good of the trade with which they are identified. This is unfortunate and unnecessary. Should fear of the courts deter some identified with association work from advocating practices which are somewhat near the safety line it will be an advantage, for it is a matter of fact, that those who bear the greatest burdens of associated effort are continually troubled to prevent the less farsighted from going beyond the bounds of propriety and using the power of the association for purposes not to be commended. The funds of any association cannot be better expended than to retain a competent and reliable lawyer, of reputation, to make a careful examination into all the rules of the association and familiarize himself with the practice in carrying them out. Such a lawyer would promptly condemn anything that was illegal and would explain how to accomplish commendable purposes in a perfectly legal manner."

THE EVILS OF SUBSTITUTION.

An interesting campaign has been inaugurated by the large magazines against the substitution of cheaper or unknown articles for more widely known and advertised products put on the market by enterprising concerns.

The magazines believe that the advertisers who stand behind their goods and stake their capital and reputation upon the good quality of their goods, are entitled to protection against the imitators and ofttimes unscrupulous concerns who market the "just-as-good" lines.

Plumbers, of all business men, cannot afford to encourage substitution, as it is upon the quality of their work and the fixture they install that the future of their business depends. The plumber who makes a practice of installing only the best-known and highest quality of goods, backed by the most careful workmanship, is the one who will win the esteem of the architects and contractors who have the placing of the best business. They, too, are the ones who will secure the best prices and reap the greatest financial reward in the long run.

Substitution has a twin evil—the appropriation of patterns of successful lines made by established manufacturers. This evil should also be frowned down upon by the trade and business given only to reliable manufacturers and supply houses, who show their confidence in the good quality of their goods by advertising them in the trade press.

INTERESTING LEGAL DECISION.

The evil results of installing heating plants, which are inadequate for the purposes for which they were intended, is emphasized in a recent decision of the Supreme Court of Wisconsin. According to the Engineering Review, a school board, having in charge the erection of a new high school building, entered into an agreement with a furnace company, in which the furnace company agreed to "furnish and set in position in a neat and workmanlike manner," a heating plant and to superintend the setting of the apparatus. By the terms of the contract the furnace company agreed that, with good care, the apparatus would warm the rooms to an average temperature of 70 degrees during the coldest weather, and that, at the same time, good ventilation would be secured.

The plant was put in, but upon the arrival of cold weather, it was found that it did not sufficiently heat the building and it became necessary to close the school. The company was notified of this by wire and sent men to make repairs, but even then the plant would not bring the temperature up to the desired degree. The school board had paid $2,800 of the contract price of $3,500, but refused the final installment of $700 on the ground that the apparatus was a failure. The company sued for the balance claimed due, and the school board entrenched itself behind a clause in the contract, which provided that if the plant did not heat the rooms to 70 degrees during the coldest weather, and at the same time permit proper ventilation, it would be made to do so or the money paid would be refunded. A judgment was given in favor of the defendant for the sum of $3,088.57, representing the amount paid by the school board with interest, in addition to which sum the furnace company had to meet the expenses of the action.

THE CURSE OF CHEAPNESS.

A conference was recently convened in London by the Worshipful Company of Plumbers, the Master Plumbers' Association, to which were invited representatives of the masters of other trade organizations for the purpose of reviving apprenticeships.

Many diverse expressions of opinion were heard as to the cause of the admittedly poor craftsmanship of the present day. The master plumbers required an apprenticeship of seven years, but some of the members contended that this term could be cut in half with advantage, as most of the first three years were wasted, and ordinarily lads of the present day were not willing to wait so long for an opportunity to earn good wages, when an errand boy could do better than they while acquiring a trade. Another member declared that the poor work of the present day was the curse of cheapness, that as good craftsmen existed to-day as ever, but they were not given an opportunity to exercise their originality in carrying out work.

The first consensus of opinion appeared to be that apprenticeships should be revived of a reduced term, and that the apprentices should be given technical school training in conjunction with practical work. A committee of prominent masters was appointed to formulate plans for carrying out the reforms suggested.

CONCRETE SAFES.

Safes have already been successfully made from concrete and, on account of their greatly reduced cost, their use bids fair to become general. As a matter of fact, a new concrete safe can be built cheaper than the old one can be removed by the owner.

One of the advantages of concrete safes is that they can be placed in all sorts of inaccessible corners by carrying a few small bags of sand and cement and building the safe on the spot. Of course, the concrete safe is not absolutely burglar proof any more than the average steel safe is, but it is sufficiently strong for all ordinary requirements against theft and fire.

A concrete safe, 2 ft. 4 in. square and 3 ft. high, was recently made by a concrete constructor in Seattle, Wash. The walls and doors were four inches thick reinforced with ¼-inch twisted steel, with lock and hinges cast in the centre of the door. The handle and castors were also cast into their places. Any intelligent workman can make a cement safe, as the difficulties to be met with in construction are few. The necessary iron castings can all be purchased at comparatively small cost. Anyone can have a good, durable and substantial safe by exercising a fair amount of intelligence combined with a small expenditure of time and money.

"I gave that odious Mrs. Doughpurse something to think of this afternoon," says Mrs. Bankfull to her husband, who was amusing himself by tossing $20 gold pieces into the artificial lake in the drawing room for the pleasure of hearing the gold pieces plunk as they sunk.

"Whajja say to her?" asked Mr. Bankfull, rolling himself a cigarette in a $100 bill.

"She was boasting about the solid gold radiators they are having put into their new house, and I told her we thought steam heat was so old-fashioned that we were going to heat our house with radium hereafter."

HEATING AND VENTILATING ENGINEERS

Summer Meeting of American Society at Milwaukee, Wis., last month.

The semi-annual or summer meeting of the American Society of Heating and Ventilating Engineers was held at the Hotel Pfister, Milwaukee, Wis., on July 18 and 19.

There was a very large attendance of members and visitors present and throughout the sessions great interest was maintained in all the proceedings and discussions.

The papers read were particularly interesting and evoked much discussion, every phase of the subjects receiving attention. The topics discussed included warm air, steam low and high pressure, hot water, and blower or hot blast systems of heating. Vacuum systems adaptable to low and high pressure also received attention.

Interesting Papers.

The paper read by Mr. E. R. Swan, Cedar Rapids, Iowa, on heating and ventilating cars, brought out many points relative to car heating and car ventilating for which there is undoubtedly a wide field for improvement, both from the standpoint of comfort and sanitation. Mr. Swan's system provides for a method of heating and ventilating of railway cars that is under automatic control, being subject to variation according to the speed of the train. He stated that one cent for each passenger carried on the railroads for one year would defray the expense of installing perfect ventilating apparatus. The papers, "Design of a Plemem System of Warm Air Heating for a School or Office Building," by J. D. Hoffman, and "Heating and Ventilating a Group of Public Schools," by Samuel R. Lewis, added two valuable treatises to the literature on blown or hot blast heating—the system of heating which in the light of present day knowledge is the best system adaptable to the heating of schools, hospitals, theatres, and large auditoriums and to all places where ample ventilation need be provided in conjunction with the heating.

Prof. Hoffman's paper was replete with data necessary to the successful design of the blown system, giving much information on this subject. Comparisons are made of various methods of calculation relative to the size of the heating coils, fans, ducts, engines, boilers and registers, and the various arrangements of the diverse parts. Much valuable information is contained in the three tables which accompanied this able paper.

Delegates Entertained.

In the matter of entertainment Milwaukee was not to be outdone. On Thursday, after the morning session, the members and their ladies were taken in fourteen touring cars out Grand Ave. to the H. W. Johns-Manville plant. The party was conducted through the paper mill, the magnesia plant, the roofing plant and the vitrabestos plant. After the plants had been visited under the leadership of C. R. Manville, general manager; C. B. Manville, vice-president, and H. E. Manville, the engineers were taken to the downtown offices and city plant at Clyburn & Third Streets. The six floors were visited and luncheon was then served to the visitors in Factory No. 2.

During the afternoon the ladies were given automobile rides through the city and on Friday they were entertained by visits to the Layton Art Gallery, the Public Museum and the Library.

After the Friday morning session the Johnson Service Company's plant was inspected and a luncheon was also served here. At the close of the afternoon session the members and ladies were driven out to Whitefish Bay, where a dinner was served.

On Saturday the plant of the Allis-Chalmers Co. was visited.

It was the consensus of opinion of all that the meeting was in every way a success and that there was ample repayment for the time spent and that much valuable information had been gained by the interchange of opinions at the meeting.

The following outline of the discussions arranged for on the programme shows the wide scope and interesting character of the work of the society :

Topics for Discussion.

1. The relative efficiency and velocity in two air pipes, one having a vertical rise of 18 inches to a round elbow supplying a pipe running horizontal for 10 feet, the other having a uniform upward inclination of 18 inches in 10 feet.

2. The difference in capacity to be provided in warm air pipes where air travels at different velocities.

3. The relative size of hot air pipes carrying the same volume of air at velocities of 100, 150, 200 and 300 feet per minute.

4. The amount of radiation necessary to maintain 70 degrees in a building having movable glass and an excessive air leakage and in one having weather strips, practically avoiding air leakage.

5. The chemical and physical properties of cast iron used in boilers and radiators.

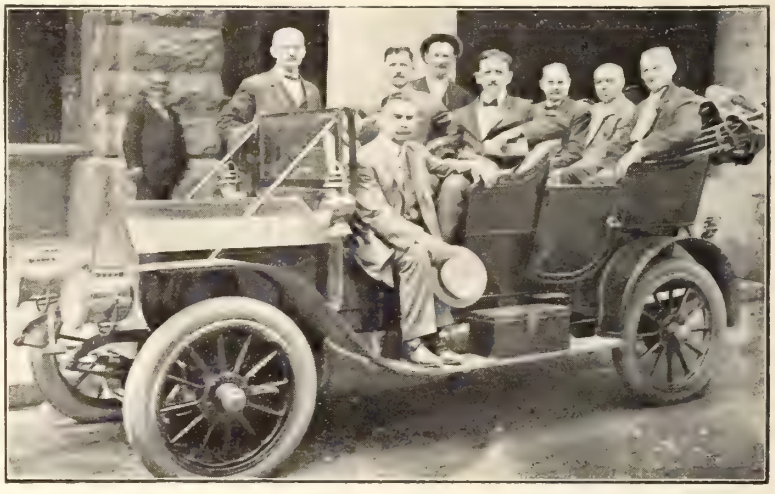
6. The relative advantage of a wet or dry return to a boiler set at the end of a long narrow building in a gravity system, and the advantage of extending the main a long or short distance beyond the last radiator connection.

7. The benefits derived from the use of fusible plugs in cast iron steam boilers.

8. The advantages in efficiency and economy of one large or two smaller boilers for carrying the same large amount of radiation, assuming in either case ample capacity for the work.

9. The comparative fuel consumption of firebox boilers in brick setting and horizontal tubular boilers.

10. The size of standard firebox boilers which should be provided to supply 1,500 pounds of steam per hour for direct radiation at three pounds pressure, burning hard coal with a 60-foot chimney and good draft.



AN AUTO PARTY AT THE MILWAUKEE CONVENTION.

Reading from left to right (at rear): F. K. Chew, editor Metal Worker, New York; J. S. Brennan, Milwaukee; C. E. Oldacre, Toronto; (in front) Jos. Mackay, Chicago; J. A. Donnelly, New York; W. M. Mackay, Secretary A. S. H. & V. E., New York; Mr. McNichol, Oshkosh, Wis., and Mr. Simes, Sioux Falls, S. Dak.

A NEW BATH TRAP.

A new bath trap has recently been invented and patented by Thomas E. Logan, of Sault Ste. Marie, Michigan, the patent for which is for sale, as Mr. Logan has no intention of manufacturing at the present time. The trap is described as follows :

1. As a new article of manufacture, a trap comprising a body which is closed at its bottom and provided at its top with an over-flow opening, an upright partition depending from the top of the trap at one side of the over-flow opening and deflected toward the opposite side of the trap to divide the latter into a small inlet chamber and a large outlet chamber, the top of the outlet chamber having a clean-cut opening, the inlet chamber having an inlet opening in its upright side, and the outlet chamber having an outlet opening in its upright side and at the same level as the inlet opening.

2. The combination with a trap divided into inlet and outlet chambers provided respectively with inlet and outlet openings, the top of the inlet chamber having an over-flow opening, of a waste pipe connected to the inlet opening, an over-flow pipe connected to the over-flow opening, a discharge pipe having an elbowed connection with the outlet opening and extending downwardly therefrom, and a vent pipe connected to the top of the discharge pipe.

FLOW OF SUPERHEATED STEAM IN PIPES

Address by E. H. Foster, before the American Society of Mechanical Engineers Convention at Indianapolis.

It is somewhat surprising that with the great number of installations which have been in practical operation there should be so little exact data available as to the flow of superheated steam in pipes. The lack of this information which is so much sought after is doubtless due to the fact that plants are usually constructed on a working basis

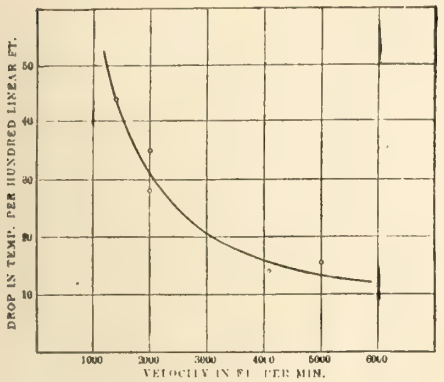


Fig. 1.

and not for experiment. As an example, a battery of boilers all fitted with superheaters will deliver steam into a common header or equalizing pipe out of which steam will be taken at various points for the engines which are being served by the boilers. This usual condition of power plant piping permits a free exchange of surplus steam back and forth, according to the demands, and throws such a cloud of uncertainty over the actual velocities of the steam in the various pipes as to effectually thwart any attempt to get a correct accounting for the cause of any decrease in temperature or pressure. Also at various plants the insulating covering differs perceptibly, both in character and thickness. Occasionally, however, a situation is found where there is a run of pipe with a known quantity of steam passing through from which data may be obtained to throw light on the laws governing the flow of steam. From quite a large number of plants we have been able to collect enough data to indicate that the laws governing the flow of

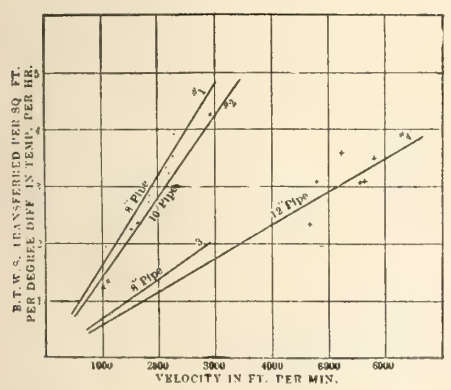


Fig. 2.

superheated steam differ appreciably from those governing the flow of saturated steam. A few general conclusions have been reached as follows :

1. That the rate of heat transfer per degree difference in temperature per square foot of surface per hour increases with the steam velocity.

2. That this increase is more rapid in small than in large pipes.

3. That the percentage loss in heat decreases with the velocity, notwithstanding the rising rate of heat transfer.

A high velocity of superheated steam in pipes is therefore recommended, because there is a smaller percentage of heat losses and because there is a lower actual drop in steam temperature.

The data at hand, while ample to show that the above conclusions are true, have not as yet been arranged sufficiently in detail to allow a formulation of the general law. It would be necessary to have a series of tests, conducted on a large scale, and on different sizes of pipe all covered in a uniform manner, in order to establish a formula covering the actual loss of temperature and pressure by superheated steam at different velocities.

Our practice is to recommend for steam pipes of straight runs or easy bends a velocity of 6,000 to 8,000 feet per minute where a superheat of from 100 degrees to 200 degrees F. is used, and we have found these proportions to give very satisfactory results.

To substantiate the foregoing conclusions, the writer offers a few curves which have been constructed from a mass of notes which have been collected from time to time; also a set of curves taken from a very excellent and complete paper read by Mr. O. Berner before the German Society of Engineers in Berlin, published in their Transactions of 1904.

This table is also given after being converted into English units. It is expected that these figures will be materially revised from time to time, as more complete data on the various subjects are available.

Table 1.

Loss in Temperature in Degrees F. for 100 Feet of Pipe. (O. Berner).

Average steam pressure, 176.5 lbs.

Average steam temperature, 482 degrees F. 105 degrees superheat.

Diam. pipe, inches	Velocity of steam in feet per minute		
	1968	3936	5904
3.937	50.3 deg.	25.5 deg.	16.45 deg.
7.874	25.5 deg.	12.7 deg.	8.23 deg.
11.811	17.0 deg.	8.23 deg.	5.49 deg.
15.748	12.6 deg.	6.07 deg.	4.39 deg.

Fig. 1 shows the rate at which the drop in temperature per hundred feet of lineal feet of pipe decreases as velocity of steam increases, and is approximately correct for pipes from 6 to 10 inches in diameter.

Fig. 2 shows that the variation in rate of transfer of heat units per square foot of degree difference in temperature per hour increases almost directly with the velocity of the steam in the pipe, and varies for the different sizes of pipes and different kinds of covering. In pipes Nos. 1 and 2 a good magnesia covering was used; in No. 3, Keasbey magnesia, standard thickness, and in No. 4, magnesia 1½ inch.

Fig. 3 is a convenient diagram to show the required cross sectional area of a pipe passing 1,000 pounds of steam per hour at velocities of 6,000, 8,000 and 10,000 feet per minute and at different temperatures and pressures.

Fig. 4 is a curve constructed from figures given by Mr. O. Berner.

DEATH OF GUELPH PLUMBER.

The death of Wm. J. Stevenson, plumber, occurred a fortnight ago at St. Joseph's Hospital, Guelph, where he had previously been operated on for appen-

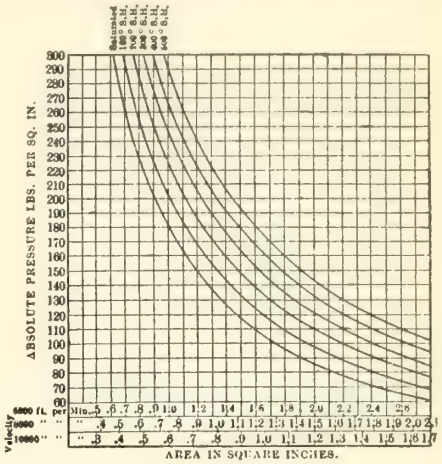


FIG. 3

dicitis. Mr. Stevenson was in his 43rd year, and was well known in the city in which he lived. He was born in Listowel, Ont., learned his business in Toronto, where he worked with Bennett & Wright for eighteen years, and for the last five years has been in the steamfitting and plumbing business at Guelph as a partner of the firm of Stevenson & Malcolm.

Attentive to business and thoroughly straightward in his methods, the late Mr. Stevenson had always demanded the entire confidence and respect of all whom he met in business. Besides a brother, John Stevenson, of Montreal, and a sister, Mrs. Dixon, Toronto, a widow and five small children survive him.

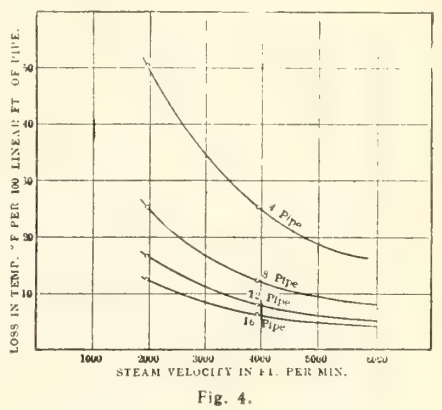


Fig. 4.

In Sweden a plumber is called a "Vattenledingsentrepenor." An American exchange says a plumber bearing such a sesquipedalian title would charge for the time it took to call him. He also would be likely to enter in his bill the time it took him to sit and wait for the last of his name to arrive on the job.

Modern Conveniences for Farm Homes

The Third of a Series of Articles Intended to Help Canadian Plumbers in Educating Residents in Country Districts to the Necessity of Better Sanitary Arrangements.

By Elmina T. Wilson, C.E.

Installation of Bathroom.

The bathroom should be a light, well ventilated room with every facility for cleanliness. Floors and wainscoting of tile or composite material are most desirable, but painted walls are much less expensive and give excellent results. Tile is undoubtedly the most satisfactory material which can be used for the covering of the floors and walls where it can be afforded. Tile floor with covered base and walls finished with cement or hard plaster, painted with enamel paint, are much cheaper. When a tile floor cannot be had, linoleum is an excellent substitute, as it is practically impervious to water. It should be laid before the fixtures are set, in order that there may be no joints. Cement mixed with small chips of marble well rubbed down after setting makes an excellent floor, one that washes as clean as a porcelain plate and has no cracks to harbor dirt; the cost is only about twice that of a double wood floor, or 50 cents per square foot, including the necessary cement bed on which it is laid.

When it is desired to lay a cement, composition or tile floor upon wooden floor joints, proceed as follows: Nail a 2x4 to the side of each of the floor joists flush with the bottom. Upon the top of these stretch wire lath, after the joists have first been covered with tarred paper to prevent them absorbing moisture; and upon this lay cinder concrete, made of 1 part Portland cement, 3 parts loose sand, 6 to 8 parts crushed and screened furnace clinkers; filling in to a level at least 2 inches above the tops of the joists. Upon this is placed the floor finishing. Cinder concrete is used because it is so much lighter than that made of stone. When a tile or cement wainscot is too expensive the walls should be painted. Wall paper is not desirable in a bathroom, nor is wood paneling.

A porcelain lined or enameled iron bathtub is the best medium priced tub. For supplying the tub with water a combination cock is best, allowing hot or cold water to enter the tub separately or the temperature to be regulated to allow of water being drawn into pitchers. The best lavatories are those of porcelain or enameled iron, with back and overflow all formed as integral parts of the fixture. The basin cocks through which the hot and cold water come are of various shapes, the simplest being the best.

The Closet.

The water closet is the most important plumbing fixture in the house, and should be selected and put up with particular care. A good closet should be simple, neat and strong, of a smooth material, with ample water in the bowl. Among the modern closets there is none more satisfactory than the flushing rim, siphon jet closet, which can be had, including the trap, in a single piece of porcelain. Porcelain is used because no other material can be kept so clean and sanitary. But even this is an imperfect protection from dirt and disease unless the bowl is flushed so as to clean

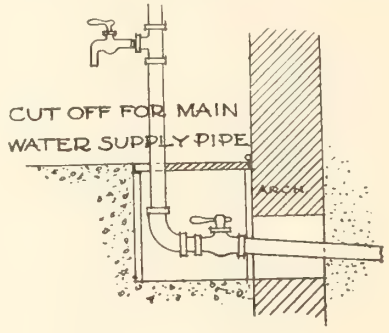


Fig. 3.—Cut Off for Main.

it completely and absolutely. The water should be poured from the rim of the bowl, so that every part of it is perfectly cleaned. The washdown and washout closets are similar in make, but are not so thorough in their action. In the washout closet the basin acts as a re-

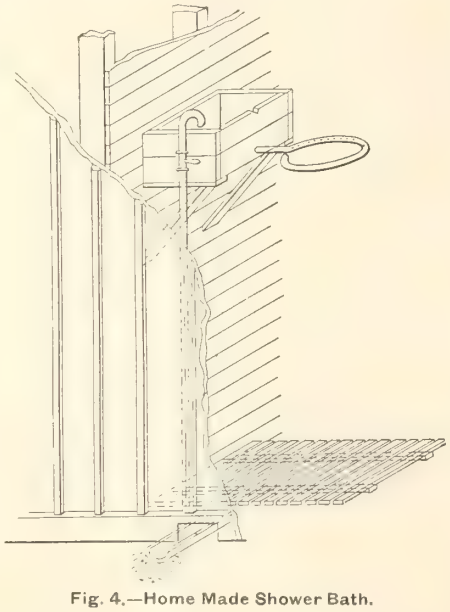


Fig. 4.—Home Made Shower Bath.

ceiver, a small quantity of water being retained in it, and into this the deposit is made, to be washed out afterward into the trap by the flush. The water in the basin is prevented from leaking into the trap by a raised ridge which is apt to break the force of the flush, so that its whole force is not directed into the trap, which is objectionable. The washdown closet receives the deposit directly into the water held in the bowl by the trap. It has a straight back and a much smaller fouling surface. There is no open vent. The outlet is entirely covered with water, so that the water does not throw the soil against the side. The only advantage the siphon closet has over it is the greater force of discharge given by the siphon.

The siphon closet, like the washdown closet, retains a certain amount of water into which filth is discharged. In addition there is a siphon trap provided with a long ascending arm, so that the water in the trap is at a lower level than the water in the bowl. The water from the flushing cistern is directed not only into the bowl, but downward into the trap itself. As a result of this discharge into the trap a siphon action is produced whereby the contents of the bowl are sucked through the trap into the soil pipe without soiling the bowl. The seal—that is, the body of water which prevents the sewer gas from escaping into the house—is deep, broad, and always in plain sight.

The flushing cistern or tank for a water closet is always distinct from the main water supply. As a rule, a plain hardwood box, copper-lined, is supported by brackets from the wall about 7 feet above and communicating with the closet by a pipe. This pipe is usually about 1½ inches in diameter and should have as few bends and angles about it as possible. The cistern should hold 2 or 3 gallons of water, all of which should be discharged at one time into the closet. The flush of the closet should be quick, powerful, and noiseless, thoroughly scouring all parts exposed to fouling.

The flow into the cistern is regulated by a float valve which allows the tank to fill, the float rising with the water; when it reaches the proper level the float is entirely raised and the supply shut off. When the tank is emptied by opening the flush valve, which is lifted by pulling a chain attached to it, the process is repeated. The cistern is usually provided with an overflow connected with the flush pipe, so that if the ballcock fails to act properly in shutting off the water the surplus will escape through the water closet to the drain instead of overflowing.

Soil Pipe Connections.

The best closets are provided with a brass screw soil pipe connection, calked with lead and cemented into the base of the closet. The corresponding threaded brass coupling is soldered into the end of the bend which connects with the soil pipe. The closet is then screwed into the threaded coupling until the

base rests on the floor. The closet may be removed at any time by simply unscrewing it. No bolts are necessary through the base flanges. In setting a water closet a neater finish can be obtained if a porcelain floor slab is put with the finished floor.

The important need of the work is simplicity, not only in detail, but in general scheme. Construct the water closet to be used as a urinal and slop sink and arrange to draw water through the bath cocks placed at the top of the tub. It not only saves cost, but is a great advantage to have the fewest possible points requiring inspection and care and to secure the most frequent possible use of every inlet into the drainage system. Great care must be taken not to throw into the water closet hair, matches, strips of cloth, or anything which is insoluble and liable to clog the trap and soil pipe. A burnt match seems small in itself, but if lodged in the trap it will collect other things and cause serious obstruction of the outlet. Tissue toilet paper should be used. Its cost would be exceeded many times if a part of the system needed to be taken out to free it from newspaper obstruction. It is often found more convenient to have the water closet with a separate entrance from the hall and entirely independent from the bathroom.

Traps and Vents.

Every plumbing fixture must have a trap to prevent the foul air from coming back from the drain through the waste pipe. In its simplest form a trap is a downward bend in a pipe, so deep that the upper wall of the pipe dips into the water held in the bend, the extent to which it dips being known as the depth of the seal. With slight modifications this is the trap most commonly used for wash basins, laundry tubs, etc. Its greatest fault is the danger from siphonage—that is, the water seal may be carried out of the trap into the soil pipe by the rush of the water when the fitting itself is emptied, by the flow of water from another fixture on the same branch waste pipe or by the discharge of water from a fixture higher up, but connected to the same soil pipe. This danger is much lessened by the introduction of a system of ventilation pipes extending upward either from the trap itself or from the outlet near the trap. To avoid this extra expense of a third system of pipes it is better to supply each fixture with one of the patent non-siphonage traps, which should also be self-cleansing. There are several good ones on the market. It is a good habit, after emptying the wash basin, bathtub or kitchen sink, to allow some clean water from the faucet to run into the fixture in order to have clean water in the trap. All traps should be provided with trap screws, placed below the water line, and arranged so as to be accessible for cleaning.

Nothing short of continuous use will prevent the evaporation of the water in the trap. One with a large dip is best, but at the same time the trap must be so formed that at each use of the fixture all the filth that is delivered shall be carried away, the trap being immediately refilled with fresh water. Hair and fibers from cloth sometimes carry the water out of the traps by capillary attraction, and care should be taken not to allow such things to enter the pipes.

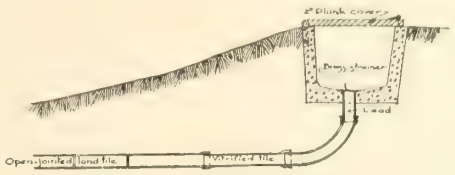


Fig. 5.—Waste Water Hopper.

The Soil Pipe.

The soil pipe should extend from cellar to roof in a straight line, if possible, as each offset or bend forms an obstruction to its proper flushing with both water and air. Use only "extra heavy" soil pipe of uniform thickness throughout, as the hubs stand the calking better.

Avoid if possible plumbing fixtures in the cellar if the drain must go under the floor. If it is necessary to make connections with a fixture in the cellar it is better that the main channel should run under the floor to or near the location of such fixtures, that all or nearly all of its length should constitute a part of the main drain, thoroughly flushed and ventilated like the rest of the system. The pipe should be laid in an open trench and so thoroughly calked that under a pressure equal to one storey in height not a drop of water should escape at any point, and then it should be closed in good concrete, after which the trench should be filled. The soil pipe should pass through the foundation by means of an arch, and the cast iron pipe should extend at least 5 feet outside the foundation; from there on a carefully laid and rigidly inspected vitrified pipe drain is to be preferred. The joint between the iron pipe and the vitrified sewer pipe should be made with neat Portland cement motar.

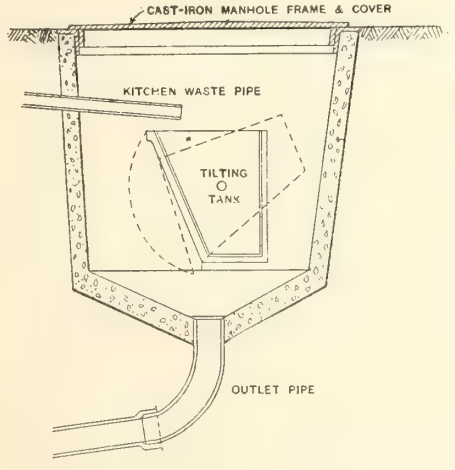


Fig. 6.—Tilting Tank in Hopper.

If there are no fixtures in the cellar carry the drain in full sight along the face of the cellar, or suspended from the floor beams, so the joints may be inspected. At the point where it is to turn up as a vertical soil pipe support it by a post or a brick pier. Use no short turns in the soil pipe, like tees and quarter bends. Two one-eight bends or a Y-branch and a single one-eighth bend give a more gradual and therefore a better change of direction. Water closets should connect to the soil pipe with a Y-branch. The soil pipe should be secured along its entire length at distances not over 5 feet with hangers and clamps or hooks, so that it will be rigidly held in position. The joints in the cast iron soil pipe should be made by first inserting a little picked oakum into the socket, allowing none to enter the pipe; it is better formed into a sort of rope. The oakum prevents the lead from running into the pipe to form an obstruction to the flow. Enough molten lead is then poured into the hub to fill it. After the lead has cooled it is carefully hammered with a special calking tool until the space between the spigot and hub is perfectly gas and water tight. Every joint should be made with a view to being tested with hydraulic pressure.

Joints Must Be Tight.

In making this test the simplest way is to close all openings into the pipe with wooden plugs or disks of India rubber compressed between two plates of iron forced together with a screw. There is no especial advantage in applying a great head of water, for if a joint is not tight it will leak under a head of a few inches. It is generally most convenient to test the vertical pipe storey by storey, the plugs being inserted through the water-closet branches. There is probably no occasion to fear that work once made tight will develop leaks for many years. The tendency to rust after a time, even with tar-coated or enameled pipe, being rather to close such slight leaks as may exist.

Four inches in diameter is sufficient for soil pipe, and the best results are obtained by running it full size straight above the roof and covering the top with a wire basket, such as is used to keep leaves out of gutters.

There should always be a trap between the house and the sewage disposal plant, and there must also be on the house side of it an inlet for fresh air. There can be no real ventilation of the system if it is open only at the top, but a generous inlet for fresh air on the drain outside the house, in connection with the opening at the top of the soil pipe, will insure a free movement throughout the whole system. The fresh air inlet must be guarded from obstruction. It may be brought out close to the foundation walls, but not too near windows and doors. If the trap is formed by the submerging of the inlet pipe in the settling chamber of the disposal system the fresh air in it should be placed close to this.

For all minor waste pipes lead pipe is used, as it may be bent and cut to suit all possible positions and requires but few joints. Only "heavy" lead pipe should be used. As lead is quite a soft

material it would not be practicable to use thread joints on it, so the joints are made by the use of solder. Where lead pipe joins to cast-iron pipe the connection should be made by means of a brass ferrule of the same bore as the lead pipe, and soldered to it. The ferrule is introduced into the hub of the cast-iron pipe and calked tight with oakum and lead as described for cast-iron pipe joints.

Water Supply Pipes.

The service pipe of the water supply should always have a stopcock on the main supply pipe easy of access, so the water can be shut off quickly in case of a break in the pipe. Such a cut-off is shown in Fig. 3. This stopcock should have a waste, so that when the water is shut off from the house all water standing in the pipe can be drawn off. The arrangement of the supply pipes should be as compact as possible, and they should be exposed to full view. No water pipe should be carried along an outside wall unless absolutely necessary, when it should be wrapt with some non-conducting material to prevent freezing. Hot water pipes will freeze quicker than cold water pipes if the fire has gone out. It is better in most cases to use galvanized-iron supply pipes.

A home-made Shower Bath.

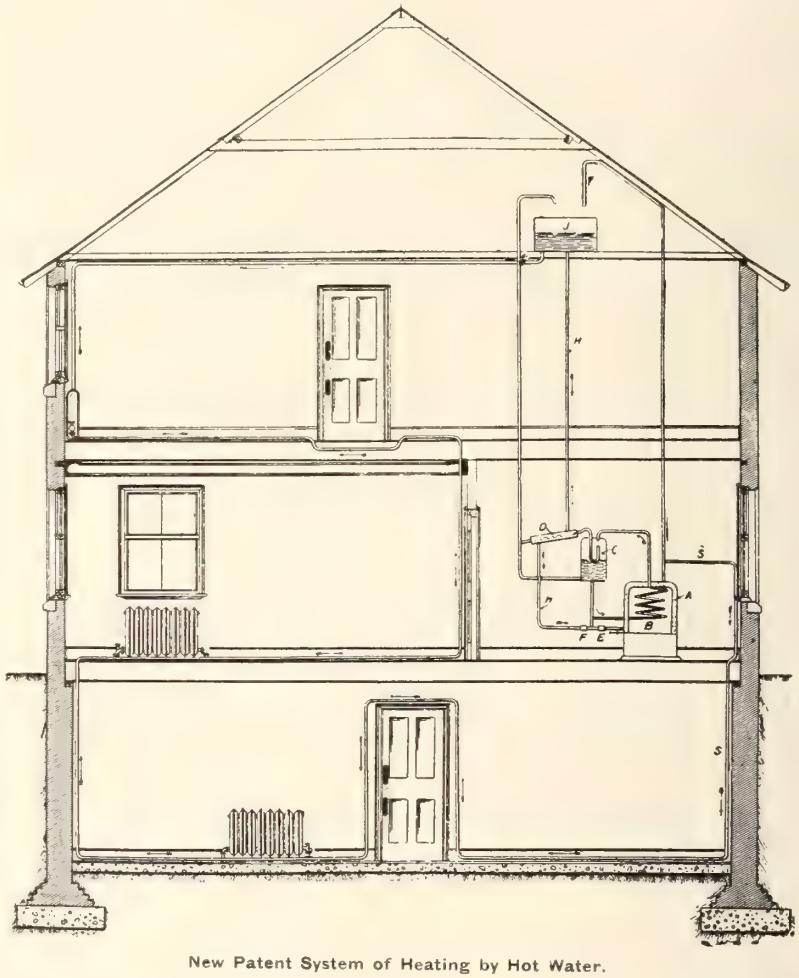
A shower bath for summer use can be arranged in one corner of the wash room or, for use of the boys, in the barn. The material necessary for constructing it are enough pipe to connect to the main pipe of the stock tank, a stopcock, a box supported on brackets and lined or not as seems best, and a perforated pipe for the shower. Fig. 4 shows how such a shower bath may be constructed in a corner of a barn.

Disposal of Waste Water.

In houses where a sewage system is not available, and the dry-earth closet is used, much may still be done to aid the housewife by the introduction of water for kitchen and laundry use. Instead of portable round tubs, oblong troughs about 3 feet in length, 18 inches wide at the top, 12 inches at the bottom, and 18 inches deep, can be built in the washhouse. Each trough should have a hole and stopper in the bottom and a gutter common to all to carry away the waste water, which, with the waste water from the bath and kitchen sink, chamber slops and other foul water, can be daily distributed in the garden by surface or subsurface irrigation. Either method is much preferable to pouring them on the ground near the kitchen door and keeping the ground about the house continually saturated.

For surface distribution galvanized roof gutters pierced with holes at regular intervals, suspended between the rows of growing plants, will distribute the liquid evenly over the ground. For subsurface distribution 50 ft. of 3-in. drain tile, laid with open joints and a very slight fall in one or several lines at a depth of 8 to 10 in. below the surface and connected with a hopper, as shown in one of the cuts, can be used. This hopper can be made of wood or galvanized iron, and is provided with a strainer and solid cover. That part of the pipe which is more than 10 in. below the surface should be of vitrified pipe and laid with cemented joints. The waste water when poured into such a hopper a pailful at a time will be distributed the length of the tile.

For a more elaborate system, a tilting or tumbling tank, also shown, can be built with pipe connections to the kitchen sink and bathroom, this tank to collect the irregular flow and empty, when full, into the drain.



New Patent System of Heating by Hot Water.

NEW HOT WATER HEATING SYSTEM.

The accompanying illustration gives a clear idea of the workings of a new system of hot water heating, described by the Engineering Review.

Steam generated in coil B collects in displacer C and presses water therefrom through non-return valve E into bottom of water heater A.

A like quantity of hot water is thus pressed from top of heater through flow-pipe S, around the circulating mains into the expansion tank J; during this operation, non-return valve F is closed; when water is displaced in displacer C to the required level, steam enters condenser D and a vacuum is produced which closes non-return valve E, opens non-return valve F, and sucks water from expansion tank J through return pipe H and condenser D until displacer C is again filled. This cycle is repeated continuously and automatically.

The heater A may be placed in any desired position preferable, but not necessarily at the lowest part of apparatus. Where need arises owing to difficulty in sinking stoke-hole, or for reasons of convenience, heater may be at any desired level below expansion tank.

Circulating mains are of small diameter, may be run in any desired direction, and dips of any magnitude or number may be introduced to suit architectural or other reasons.

The following advantages are claimed for this apparatus:

1. Automatic forced circulation of the water.
2. The circulation of the water is independent of difference in density of the water in the flow and return pipes.
3. The circulating mains can be run practically at will. Dips under or over doors, passages, etc., being easily negotiated.
4. The boiler may be placed at any level either above or below the heating pipes or radiators, as long as it is below the expansion or feed tank.
5. Rapid circulation.
6. Small circulating pipes.
7. The apparatus is always open to the atmosphere.
8. Economical in fuel. The water be-

ing forced through the boiler, it receives heat more rapidy and readily than in an ordinary low pressure boiler in which the speed the water passes through the boiler depends upon the atmosphere to which it is heated.

9. No separate steam boiler. The steam to circulate the water is generated in a coil contained in the water heater, no separate cold water feed being required.

10. Cost about the same as ordinary open system hot water apparatus.

REPAIRING LEAKY VALVES.

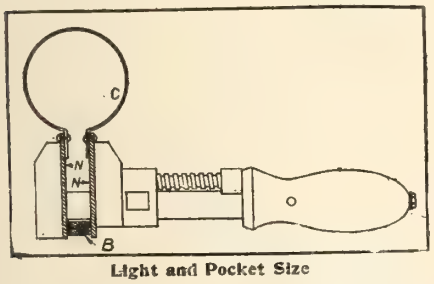
Often globe or angle valves used for cold or hot water, or other liquids, start leaking after being in use for some time, writes J. Ellethorn, Toronto. Of course, where a set of reseating tools are available they can soon be repaired, but these handy tools are not always on hand. A simple method of overcoming the difficulty is to remove the hood and sandpaper the brass valve disc bright where it sets on the seat, then go all around it with a hot soldering iron and place a coating of solder all around it; when it is put back it will be found to be perfectly liquid tight. This scheme is not effectual where high pressure steam is used, as it will not stand long in this case.

RUBBER FLOOR TILING.

The growing popularity of interlocking rubber tiling is shown by its invasion of new fields, being extensively used in kitchens, vestibules and bathrooms of the better sort; in fine ocean liners, lake steamers, ferryboats and yachts, where its non-slippery character and the fact that it remains unaffected by constant wrenching strains render it very valuable, and now it may be seen in one of the finest cathedrals in the country and in one of the largest of our public art galleries.

PIPE WRENCH FOR SOFT PIPES.

To make a wrench for gripping soft pipes or rubber hose secure a piece of heavy clock spring, punch a hole in each end and rivet to two pieces of iron (N.N.), about 4 in. long. To



Light and Pocket Size

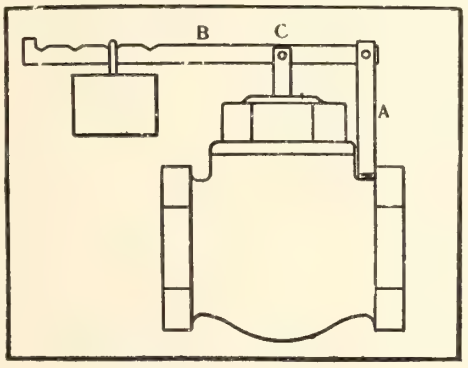
use when it cannot be gripped tight enough by hand, place any solid object between ends of handles and apply monkey wrench, as shown. It is light and small and may be carried in pocket. For gripping small pipes or hose, wind a leather strap about the pipe and grip the strap.

NEW VENTILATION LAW.

Pennsylvania has a new ventilation law regarding the ventilation of public schools and a new measure has recently been introduced covering other classes of buildings, such as places of amusement, churches, halls and private schools built after July 1, 1907, any room of which has a seating capacity of 25 or more persons. In such rooms not less than 25 cubic feet of fresh air per minute per person is provided for, exclusive of that admitted through doors and windows. Workshops and factories are also to be provided with means for removing vapors, gases, dust and other injurious particles.

SAFETY MADE FROM CHECK VALVE.

The accompanying sketch shows how a Utah engineer made a safety valve from a check valve. The body of the check valve was tapped to receive the stud (A), which was slotted out at the unthreaded end to receive the lever (B). A similar stud is screwed into the valve disc and is hinged to the lever at (C).



Home-Made Safety Valve

This stud passes through a hole in the cap, which should be drilled a little larger than the stud so that it won't bind. In connecting with the steam or other pipe be sure that the pressure comes on the lower side of the disc otherwise the valve will not operate.

SCHOOL HOUSE HEATING IN BOSTON.

The fan system of positive heating and ventilation has been extensively introduced in Boston under the following conditions imposed by the schoolhouse commission:

(a) Allow about one-quarter foot area cross section of heat ducts for each fourteen occupants.

(b) Locate in a corner room within ten feet of outside wall.

(c) Locate in a room with one outside wall, fan to be on inside wall near middle.

(d) Bottom of opening to be about eight feet above floor.

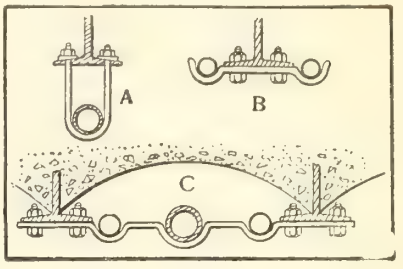
(e) Opening to be one-third larger than area of dust.

(f) Opening will be provided with ⅜-inch ground and galvanized steel.

(g) Galvanized iron deflectors to match will be placed in each opening.

PIPE HANGERS.

The accompanying illustration from The Practical Machinist shows a few practical suggestions for supporting pipes from I-beams. The most common form is shown at A, and is used for supporting a pipe directly under the beam. When pipes are to be run



Pipe Hangers for Beams.

on each side of a beam the form of hanger shown at B may be used, unless the pipes are some distance from the beam, when it will be necessary to use the form shown at C.

QUEER PLACES FOR BATH TUBS.

The notorious disregard of the necessity for bathing facilities in the English household, built in the past as well as those of the present day, which has created so much adverse criticism on the part of visiting Americans, is gradually being overcome, says the Philadelphia Record. However, to an American the subterfuges for bathrooms are extremely amusing. In one case, and this is very recent, it was proposed in a "model" house to sink a bathtub in the floor of the kitchen and to cover it with a trapdoor when not in use, the supply of water being obtained from the near-by sink by means of a flexible hose connection.

A still more recent so-called "bath installation for small houses and cottages," which is advertised in the leading plumbers' trade journal of Great Britain, consists of a galvanized iron bathtub arranged upon a platform which it is proposed to elevate bodily to the ceiling when not in use. It is explained that this makes an admirable installation for the "scullery or kitchen of the small house property." The bath is fixed upon a platform with feet, and by means of pulleys and steel ropes it is raised much as an elevator would be, upon uprights placed against an adjacent wall. Short lengths of hose are used to connecs the bath with the hot and cold water pipes of the sink. When it is desired to empty the bath it is raised above the level of the sink, a rubber hose allowing it to be emptied into the sink.

Each day should find one doing things better than previously. Acquire the habit of promptness in every matter, large or small, which is left to your care.

ARE UNIFORM PLUMBING REGULATIONS DESIRABLE?

John B. Duncklee discusses this subject before the American Society of Plumbing Inspectors' Convention at Cleveland.

The highest duty of the State is to provide for the welfare of its citizens and this duty can have no more important field of action than that of securing for every family within the State a heathful and sanitary dwelling. With the advance in modern civilization and the general introduction of public water supply and sewerage systems in cities and towns, came the important problems of house sanitation and the consequent adoption of plumbing regulations. The need of such regulations has now become so fully recognized that a code (more or less perfect) may be found in nearly all our important cities.

One of the most important developments of this new century, however, is the rapid spread of suburban life. The construction of electric railways, radiating from our business and manufacturing centres, has brought those into rapid and cheap communication with outlying towns and villages. As a result of these and other improved transportation conditions, has come a widespread suburban development with the construction of suburban houses in large numbers and a general increase in our suburban population.

Sanitation in Suburbs.

The suburban dweller has the same needs, and makes the same demands, for water supply and sewers, as the city dweller and so it comes about that towns must provide these modern conveniences if they are to attract and hold an increased population. With these improvements come the necessity for a proper sanitary code and plumbing regulations. In other words, the needs of the city, as to house sanitation, are to-day the needs of its suburbs, of towns and of all thickly settled sections of the State.

The framing of a code of plumbing regulations requires the skill and experience of the sanitary engineer and it is not to be expected that the governing bodies of the towns and smaller cities of our States should have the technical knowledge needed for this important task or even that they should appreciate its vital importance. We are not surprised, therefore, to find in many such communities, either no plumbing regulations at all or else very imperfect or indifferent regulations, with no adequate means for their enforcement. These conditions render of great imimportance the question as to whether plumbing regulations shall be framed by the State or by the various cities and towns.

If framed by the several municipalities, there will inevitably be great variation in the regulations. Some cities and towns will avail themselves of the advice of experienced sanitarians and frame regulations which conform to the latest developments in sanitary science, while others less well advised, will adopt imperfect or even unsafe regulations, which must, in time, endanger health or even cause disease. In other cases, as has been suggested, the framing of regulations will be entirely neglected.

Just here is found the duty of the State, with its larger and broader powers, to protect the health of all its inhabitants by providing for the framing of plumbing regulations, which shall be of a high standard and which shall apply to every municipality in that State.

Advantages of Uniformity.

The advantages to be gained by State plumbing regulations are:

1. The adoption of regulations which will be of a higher standard than if framed by the average city or town.
2. Improved health conditions throughout the entire State.
3. Uniformity of sanitary practice among sanitary engineers and plumbing inspectors.
4. Standardization of pumbing fixtures and material for use in the State.
5. Better conditions, as to the installation and execution of work in the plumbing trades.

These advantages are so self-evident, that they need no argument in their support.

The best method of securing State control and supervision of these important questions will probably be found to be, the passage by the State Legislature of a law creating a "State Board of Sanitation," composed of three experienced sanitary engineers, who should be charged with the duties of (1) Framing plumbing regulations applying to all municipalities in the State, or to the entire State, together with the amendment of such regulations, and (2) Supervising the enforcement of these regulations, through the plumbing inspector of the various municipalities or by means of special State inspectors, where no municipal inspectors are provided. Such a law, it need hardly be added, should be broad in its scope and provide ample means for its enforcement, as well as adequate penalties for failure to comply with its requirements.

Code Subject to Revision.

It will be noted that the legislation proposed provides for the framing and amendment of the plumbing regulations by the State Board of Sanitation and for the following reasons: The science of sanitation, although it has reached a well established stage of development, is, like all other branches of science, still progressive and with continued investigation and discovery, existing views may be modified and new truths established. It follows, therefore, that a code of plumbing regulations based upon such a progressive science, should be flexible to the extent of being readily revised, enlarged or amended, to meet corresponding advances in sanitary science. If the regulations are embodied in a law, they can only be amended by legislative action and such action may often either be found impracticable or else long delayed. Besides this, if a legislature were to act upon such a question, it would only do so after, and upon the advice of, such experts as will compose its State Board of Sanitation. The same result, therefore, will be attained and the public interests more promptly met, by assigning to this board both the framing and the amendment of the plumbing regulations.

Before framing the regulations in the first instance, the board should carefully examine the existing plumbing regulations of all municipalities within the State, as well as those of the more important cities in the United States and should hold an ample number of duly advertised public hearings, to the end that every phase of the subject may be considered and every interest have due consideration. A similar procedure should apply to all amendments.

Even better and more far reaching results would be secured by the State if the powers and scope of such a board were enlarged so as to cover building regulations as well as plumbing regulations, adding to its number experienced architects and constituting it a "State Board of Building and Sanitation." In this way, the entire field of house construction and house sanitation, within the State, would be covered.

SANITARY SOAP HOLDER.

We illustrate herewith a liquid soap retainer which is coming into general use in the toilet rooms of railway stations and hotels in the United States. A liquid soap solution is placed in a spheri-

Sanitary Soap Holder.

cal glass retainer which is so balanced that it may be tipped, causing it to deposit in the hand of anyone wishing to use it a sufficient amount of liquid soap for a thorough cleansing. The soap is claimed to be prepared from pure vegetable oils and to have unusual cleansing properties.

A DUSTLESS ASH SIFTER.

To make this device all that is needed is a galvanized iron can, such as is generally used for garbage or ashes; a circular sieve, a wooden cover and some round iron for making the links and handle. The links are hung on screw hooks screwed into the cover and support the sieve by means of hooks fastened to the sides. In operation the sieve may either be moved backward and forward or it may be given a revolving motion. The revolving motion is more effective at first, but soon causes the ashes to pile up around the edge of the sieve.

INTERESTING SANITARY COMMITTEE REPORT

The following report made by the chairman of the Sanitary Committee of the Indiana M. P. A. at their recent convention, covers many interesting points which will be read with interest by the trade in Canada.

Main and Branch Sewers.

Large main concrete and brick sewers are well constructed, but branch or alley and street sewers made of crock sewer pipe seem to lack a whole lot of being what they should be. I believe that crock pipe is the best material, but the method of laying these pipes should be improved.

They should be laid in more perfect line and grade, and in order to lay the pipe properly the trench should be safely braced and the inspector should have a transit level to see that every joint of pipe is at the right grade.

Now to come to what I consider of vital importance is the joints of the pipes, for which some method should be devised to make them tight. In stiff clay ground, I would recommend some dampened clay put on like cement, and the dirt well rammed in under and all around the pipe; if the ramming is not done the pipe will not stay in place and in a large pipe the weight of the full trench of dirt on top of the pipe will invariably crack the pipe.

The Importance of Tight Joints.

In sandy soil it is really of more importance to have the joints tight and I would recommend, first, a good fit into the bell; second, a piece of hemp or other such packing, and third, good Portland cement mortar, being very particular about getting the joints tight at the extreme bottom.

Another very important point is the Y anh T connections. Plenty of these should be put in, better too many than too few, and the inspector should take perfect measurements and note these connections, and these notes and measurements should be properly recorded in the maps and records of the public sewer department, and all such information should always be at the disposal of the plumbers and sewer contractors when wanted.

The branch to the house should be laid with equal care and the joints made in the same manner, under the same conditions as the alley sewer, except on small pipes where it may not be necessary to use any packing.

The line to the building should be perfectly straight and the sewer should come into the building twelve inches below the cellar floor.

I do not recommend large pipes for house sewer; 4-, 5- or 6-inch pipe is large enough for any ordinary building. For houses of ten rooms or less I would use 5-inch pipe; all pipe should be known as No. 1- and clear inside. Crock pipe can be run only to within ten feet of the building and from this point cast-iron pipe is to be used into and inside the building.

On the long line of sewer, standpipes should be run up to the ground level with top cemented shut and a stone marker to locate it. You will find this standpipe a great convenience to locate any trouble, if such should occur, and also a place from which to flush the sewer.

The Main Trap.

The most important part of the house drain is to have no main trap on it and no so-called fresh inlet. I suppose that this method will be objected to by some of the members, but, while I do not want to start a controversy, this is the correct method and there are no ifs nor ands about it.

While it makes no difference to me if men will put four traps in the house drain (which I have seen done), I would warn all men who still insist on putting in main traps and so-called fresh-air inlets of the fate of all people who get in the road of progress.

I was at one time an advocate of universal peace and opposed to wars, but in an argument with a friend he brought forward that war was a good thing because only fools will fight and kill themselves, and this gives fair-minded men a chance to make progress.

Brick Vaults.

Before leaving this part of the subject I want to condemn a practice we have in Ft. Wayne—and I hope nowhere else—of having connections made from the alley sewer to brick or crock privy vaults. These vaults are an abomination, and the man that invented connecting them to sewers should have one of them when he dies for a monument. How people, calling themselves civilized, will stand for them is only explained by the fact that they get used to anything by long association; but I consider it little short of a crime to connect one of these vaults into a city sewer. They should be cleaned out and disinfected with lime and then filled with dirt. I have called the attention of the city officials to this nuisance, but they only look at me in a helpless sort of a way.

In our city rain water is retained, and a few rules about cisterns would not be out of place, as follows :

1. Place the cistern at least twenty feet from the house.

2. Use heavy cast or wrought iron conductors close to the house to take the water from the down spouts. These down spouts should be one size larger than ample size. Every cistern should be filtered; the method of porous brick seems to give good satisfaction.

3. Have an iron or stone top on cistern.

4. An overflow from the cistern connected to the house sewer is not good practice. To some people it is quite a problem where to run the cistern overflow, but the best way is no doubt to eliminate it, cementing it shot tight.

5. Have the cistern one size larger than ample size.

Grade of Lot.

It might seem to be a little out of place at a plumbers' convention to talk about grade and landscaping, but, in my opinion, they should consider everything pertaining to house drainage, and I would lay down the following rules :

The highest point of the lot should be where you step, out the rear door; don't be afraid of getting this point too high, and start the slant of the lot in all directions from this point. The rear steps should always be of stone or cement and all walks around the house should be of the same material.

The cellar should be dug under the whole house, but if it is a matter of economy I recommend that the whole centre be dug out and form a shelf or bank about three feet wide over to the foundation. The best material for foundation is concrete.

The cellar floor should be cemented and a gutter should be formed all around the cellar floor, slanting towards the cellar floor trap.

The cellar should be not less than 7 feet deep, or 7½ feet, and 8 feet is better.

The cellar floor should be drained into a floor trap and the floor trap should be caulked into the soil pipe ; this trap should also be of a pattern to prevent sewer gas, rats or back water from coming into the cellar and should be protected with a grate to prevent anything that might obstruct the sewer. Modesty prevents me from mentioning the trap which should be used in such a place.

As a general rule I find that the work inside of houses is pretty well done, and I can find no fault with the ventilation or the general system that is being installed.

CONVENTION PROGRAMME.

The officers of the Canadian National Association of Master Plumbers have just issued the following programme for the convention which is to be held in Montreal, August 21 to 23.

Wednesday, Aug. 21.

9.30 a.m.—Meeting of Executive Committee.

10.30 a.m.—Official opening of convention.

2 p.m.—Meeting of convention.

4.30 p.m.—Trip to Lachine to shoot the Rapids.

8 p.m.—Theatre party (Bennett's new theatre.)

Thursday, Aug. 22.

9 a.m.—Meeting of convention.

2.30 p.m.—Visit to exhibition at Victoria Rink.

4 p.m.—Photo at Rice's studio.

5 p.m.—Car ride to Bout de L'Isle.

8 p.m.—Banquet at Bureau's Hotel, Bout de L'Isle.

Friday, Aug. 23.

9 a.m.—Meeting of convention—Election of officers. —Interview between wholesale representatives and master plumbers.

2 p.m.—Meeting of convention.

4 p.m.—Carriage and trolley drive to Mountain " Lookout."

Officers of National Association.

President.—H. A. Lamontagne.

Secretary.—J. E. Walsh.

Treasurer.—John Watson.

Reception Committee.—L. Cohen, R. McLaren, J. Corcoran, G. C. Denman, L. J. Conroy, C. E. Thibeault, Jos. Laurier.

Entertainment Committee. — R. J. Lockhart, S. R. Brewer, L. Cohen, F. Outram, R. McLaren, F. Rawley, R. J. McCauley, H. Rodden, J. Corcoran, C. E. Thibeault, E. Taylor, P. C. Ogilvie.

Officers of Montreal Association.

President.—W. Turcot.

1st vice-president.—J. A. Gordon.

2nd vice-president.—J. A. Morier.

Secretary.—J. E. Walsh.

Trustees.—Jno. Watson, Jos. Thibeault, R. J. McCauley.

BUILDING ACTIVITY THROUGHOUT CANADA.

The new Archibald Block, Edmonton, will cost $22,000.

W. H. Stone is building a $40,000 store in Winnipeg.

Edmonton's new Y.M.C.A. building will cost $65,000.

The new police station in Toronto will cost $24,000.

The new school at St. John, N.B. will cost about $50,000.

The C.P.R. is asking for tenders for a station at Calgary.

A flour mill will be erected at Calgary costing $20,000.

The Blowey-Henry Block at Edmonton will cost $60,000.

A hotel is to be erected at Kenora, Ont. to cost $225,000.

A school will be erected at Manor, Sask. costing $10,000.

J. A. Weart, Vancouver, will build a fourteen-storey building.

The new fire hall at St. Boniface, Man., will cost $20,000.

H. Clemes will build a residence in Toronto to cost $10,000.

R. R. Dingwall, Winnipeg, will build a residence to cost $20,000.

A schoolhouse will be erected at Vermilion, Sask., to cost $20,000.

The Manitoba Government will erect a telephone exchange at Brandon.

A technical school will be built at Sault Ste. Marie to cost $20,000.

A high school will be erected at Smith's Falls, Ont., to cost $45,000.

A fourteen-story building will be erected at Vancouver to cost $450,000.

A. B. Coleman will erect an apartment house in Toronto costing $10,000.

S. A. Weismiller will erect two pair brick dwellings in Toronto to cost $10,000.

The Bank of Montreal will erect a branch at Portage la Prairie to cost $55,000.

C. A. Crump, Riverside, Cal., will build a business block in Winnipeg costing $45,000.

The Merchants Bank of Canada will build a branch at Victoria, B.C. costing $40,000.

The Real Estate & Security Co., Ottawa, will build an apartment house to cost $75,000.

There were 149 building permits issued in Toronto Junction in June aggregating $440,000.

The Bank of British North America will build a branch at Duck Lake, Sask. costing $4,000.

The congregation of the First German Baptist Church, Winnipeg, will erect an edifice to cost $27,000.

The congregation of St. John's Church, St. Thomas, will erect a new church to cost $10,000.

Geo. McNeil, Calgary, intends to erect a seven-storey apartment house. There will be over forty suites of rooms with all modern improvements.

Among the buildings being erected at Regina are: F. N. Darke, business block to cost $110,000; Masonic Temple $50,000; J. W. Smith, block $90,000; MacKenzie & Brown, block $35,000.

A modern apartment house will be erected at Vancouver costing $350,000. Campion & Pound are the local representatives of the company.

The following buildings are being erected at Saskatoon: The National Trust Co., $30,000; Canadian Bank of Commerce, $65,000; the Great West Furniture Co., $50,000; the Sutherland Block, $10,000; the Alexandra School, $35,000. HM—Industrial

Despite the large number of building permits issued at Toronto last June, the report for June indicated that the permits had exceeded those for the same month last year. For June of last year the total was $1,350,000, as compared with $1,445,000 for June of this year.

Statistics gathered from 37 towns throughout the west show that buildings actually under way therein amount to $22,500,000, exclusive of Winnipeg. In Edmonton alone $6,000,000 will be expended in new structures. This wonderful development, great as it is, would be one-third more were it not for the prohibitive rates charged for lumber. Wages are uniformly high.

Among the buildings being erected at Prince Albert are the following: Sanderson & Knox block, $55,000; Pollock block, $10,000; Moore block, $40,000; Prince Albert Times block, $5,000; G. W. Baker, residence, $12,000; high school $100,000; fire hall, $10,000; Baker & Eaton block, $40,000; R. C. church, $50,000; S. J. Donaldson, residence, $5,000, and A. MacDonald, residence, $8,000.

The building permits in Regina for 1907 are estimated at three million dollars. Among the more important buildings going up are, the new post office, costing $250,000; the Northern Bank, costing $115,000; the Canada Permanent costing $42,000; and the Mackenzie & Brown building, costing $15,000. Many warehouses are going up. Among these are buildings of the International Harvester Co., the Nichols & Shepherd Co., and the Reeves Co.

TORONTO PLUMBERS' STRIKE.

Exactly three months have elapsed since the commencement of the Toronto plumbers' and steamfitters' strike and up to date there is not a single prospect for a speedy settlement. The union is still willing to negotiate with the employers—as it has been from the beginning—but the latter claim that reference is useless, as there can be no recession from the position the employers took at the start of the trouble. In view of the many items in the papers, stating that the master plumbers are about to meet their former employes and arrange a settlement, the Master Plumbers have deemed it advisable to publish the correspondence that has passed between them and the Plumbers' Union. As will be seen, the Master Plumbers have made no offer of a settlement, and their reply is merely a formal answer to the plumbers' letter:

Toronto, June 25th, 1907.

Mr. Gordon Ritchie,

Sec. Master Pumbers' Association.

Dear Sir—Individual members of your organization having from time to time approached members of local 46 with a view to arranging a conference between committees representing the two associations, I am instructed to inform you that we are now, as we have ever been, willing that a committee from this local should meet a similar committee from your association, with a view to arriving at an amicable settlement of the matters in dispute.

Respectfully yours,

Geo. S. Kingswood, Secretary.

Toronto July 24th, 1907.

Geo. S. Kingswood, Esq.,

Sec. Journeymen Pumbers', Steam and Gasfitters' Local Union. No. 46, Labor Temple, Toronto.

Dear Sir—I beg to acknowledge receipt of your favor of July 19th, enclosing copy of a letter dated June 25th, in answer to which I beg to state that the management committee of the Master Plumbers' Association are unaware that any member of the association has approached any of the members of local No. 46, with a view to arranging a conference between committees representing the two associations.

There has been no change in the situation of the Master Plumbers, as explained to the committee from the union when they met previous to the strike being declared. There does not seem to our management committee any sufficient reason for a meeting of the committees from the two associations. Should you have any proposition to make, it will receive the careful consideration of the committee if forwarded in writing to the secretary of the association.

Thanking you for your favor, I remain,

Yours truly,

Gordon Ritchie, Secretary.

This correspondence shows that the attitude of the employers toward the men has not weakened in the slightest; the struggle has lasted three months and so far none of the firms connected with the Employers' Association have come to terms with their workmen.

On the other hand, the fact that at last Friday's meeting the union decided to increase the weekly allowance of each striker from $5 to $6.50, shows that the union's finances must still be in a very healthy condition. The refusal to grant several applications from members to start business on their own account is another evidence of the union's strength. The strikers have remained steady and about 260 men have left the city, getting situations in the United States. At the time of the strike the union had 460

SITUATIONS VACANT

WANTED—A salesman familiar with plumbing supplies and gas ranges, to represent a Canadian manufacturer direct to the wholesale and retail trade; must have acquaintance with the trade; best of references will be expected; give full information concerning experience, acquaintance with the trade, salary expected; good position for the right person. Only those who can fill the above qualification need apply. Box 639, Plumber and Steamfitter, Toronto.

members. Over 300 men have since been initiated and 250 are still out. With strike pay now forthcoming to idle men at the rate of $6.50 per week, the latter claim to be satisfied and the union claims that its big fund will enable it to hold out indefinitely. Besides the regular weekly cheque from the international union, the local receives 25 per cent. of the weekly pay of 200 men who are working on permits.

The employers are equally strong financially and declare that they will fight the union to the finish.

TO STOP GAS TUBE FROM LEAKING.

The ordinary woven tubing for connecting lights, stoves and heaters to the gas jet almost invariably leaks. The salesman will claim that the gas soaks through the webbing and that the odor cannot be avoided except by buying expensive tubing—10 to 15 cents a foot. The fact is that the leak is at the junction of the rubber tips with the webbing, as you can prove easily by wrapping the joints carefully with bicycle tape. Examine your tubing closely before buying to make sure that it is not defective or broken at any point, and then wind the joints spirally and tightly with the tape, going over it twice in opposite directions, and continuing it at least 1½ in. each way from the junction. It will be still better, if you have any rim or tire cement, to smear joint freely before wrapping. In this way a 5-cent tubing is made odorless.

MORE WORK FOR STEAMFITTERS.

Dr. Mehner, a German, is responsible for the latest agricultural idea, which is now the subject of experiment in Germany and France—that of artificially heating the soil for the purpose of pushing the growth of vegetables. It is said to promise remarkable results, especially in the quickening of spring vegetables and their development in size and luxuriance.

The method consists in burying at a depth of 20 to 40 inches under the field to be treated conduits of earthenware, through which steam pipes about an inch in diameter are laid. Steam at a temperature of about 300 degrees is forced through the pipes; it warms the air in the conduit and the heat slowly radiates through the clay conduit, warming the earth.

Leakage of heat is very slow. Experiment is said to show that when the surface of the ground is about freezing point the soil at a depth of 12 to 20 inches has a temperature of 42 degrees.

Assuming that the artificial heating were begun early in March, when this condition existed, a very small expenditure of heat would be needed to cause the desired stimulation, and the radiation into the air would be exceedingly gradual. In warmer weather the surface heating from the sun would actually counteract the radiation of the artificial heat.

Of course, the plan does not contemplate heating the soil in the dead of winter, when atmospheric cold would kill any plants that might be artificially caused to germinate. The idea is simply to aid nature when the spring sets in.

Asparagus, lettuce, young onions, cucumbers, radishes and other spring plants are the ones on which it is expected to use the system with most effect. Later in combination with forcing frames it may be used on strawberries, and experiments may be tried on various fruit trees. The method is likely to be applied to floriculture and the growth of plants for seed purposes also.

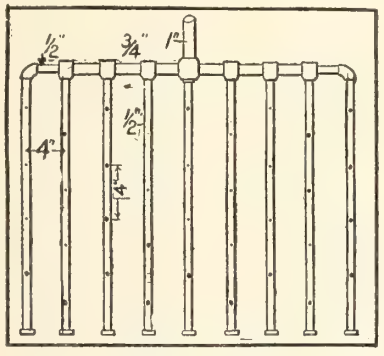
It is calculated that the expense of installation for each space of 2,500 square yards in Germany or France is about $250 plus the steam generating apparatus, which may be large or small, according to the tract to be heated, and which may be used for other purposes. The cost of the heating is figured at $15 a month.

The annual increase in profit for the same patch of ground sown with early vegetbbles is figured at $500 on a three months' heating of the soil.

EMERGENCY STEAM BLOWER.

A stack was blown down at a lighting station, and, as the plant had to be in condition to run the same night, a steam blower was made to serve the purpose.

A steamfitter constructed one like that shown in the accompanying sketch,



Steam Blower.

the vertical pipe being ½ in., 4 in. apart; the holes were 1-16 in., 4 in. apart. This was applied to the boiler, says Power, and the station started up on time. This blower continued to furnish blast for the boiler for a period of six months.

CALGARY DISPUTE SETTLED.

The board of arbitration selected to inquire into the dispute between the master plumbers of Calgary and their employes has succeeded in effecting a settlement, and the agreement is expected to be satisfactory to both parties. By it the rate of wages is fixed at 52½ cents per hour. The other questions in dispute were satisfactorily settled, the decisions in most cases slightly favoring the employers.

TORONTO PLUMBER DEAD.

T. H. Fitzsimmons, of the firm of Keith & Fitzsimmons, Toronto, died on August 8. Deceased had been for many years a prominent business man in St. Catharines, but of late years had been connected with the firm of Keith & Fitzsimmons Company. Besides a wife, he leaves two daughters and one son.

AN ELABORATE CATALOGUE.

The Gurney Foundry Co., Toronto, have just issued a magnificant 9x11-inch catalogue containing 187 pages replete with illustrations, descriptive of their various styles of stoves, ranges, warm air furnaces, steam boilers, hot water heaters, radiators, general castings, etc. In the centre of the front cover is a magnificent 5x5-inch colored engraving representing a typical foundry scene. Ten moulders are seen carrying away the molten metal from two huge cauldrons into which it falls from glowing furnaces in the background. The dancing light of the red hot metal, which casts a lurid glare on windows, walls and floor and is reflected back on the animated faces and sinewy arms of the moulders, makes the picture extremely realistic. The rest of the cover surrounding this scene is handsomely embossed in black, gold, green and pale green colors, the artistic effect obtained by this color combination leaving nothing to be desired. The first two inner pages of the catalogue contain fine engravings of the company's huge stove and furnace foundry, and boiler and radiator foundry, respectively. Immediately after that the company's telegraphic code is explained and then follow a few pages of general directions for operating stoves, ranges, waters, radiators, etc. Gas ranges, hot water boilers, radiators, hotel ranges and the various parts of each are all shown and described in an interesting manner. This handsome and comprehensive catalogue, together with a separate price list booklet, may be obtained by writing the company, mentioning this paper.

WANTS CATALOGUES.

F. R. Agnew, Calgary, Alta., has been appointed agent for Crane & Ordway, manufacturers of plumbing and steam fitting supplies, St. Paul, Minn., which firm have also established a branch in Winnipeg. Mr. Agnew writes us that he would be pleased to receive catalogues from manufacturers of plumbing supplies and hardware.

Standard Shower Baths is the title of an interesting little booklet recently sent out by the Standard Sanitary Mfg. Company, Pittsburg. It gives an idea of the great variety of shower baths this company now has on the market. Among the most complete are combination shower and needle baths, with special sprays for practically all parts of the body, each being controlled by different valves. With this bath there is a special nonscalding valve and mixer. In all, 20 different and distinct styles of shower baths are shown and illustrated in this booklet.

Somerville, Limited, Toronto, have placed an order with the Robb Engineering Co., Amherst, N.S., for a 200 horse-power Robb-Armstrong Corliss Engine.

NEWS OF THE TRADE IN CANADA

Gracefield, Que., will install a waterworks system.

Halifax, N.S., will install water meters at a cost of $50,000.

Lecuyer & Daniel, Montreal, plumbers, have dissolved partnership.

A municipal waterworks system will be installed at South Vancouver, B.C.

J. E. Knott has opened a new plumbing shop at 1103 Queen St. east, Toronto.

The Montreal Pipe Company, Londonderry, N.S., will install a plant for the manufacture of car wheels.

The pumping plant at Well 5 of Fort William's waterworks system was destroyed by fire ; loss $12,000.

A new steam heating plant and ventilating system is to be installed in St. Joseph's Hospital, Guelph, Ont.

The International Heating and Lighting Co. will erect a gas plant in Edmonton, costing over $1,000,000.

The Deleware Seamless Tube Co., Reading, Pa., may build a large plant at Sarnia, Ont., to cost $200,000.

The death of W. J. Bolt, representative of the Ideal Mfg. Co., Windsor, Ont., occurred at Detroit on Tuesday of last week.

Geo. Watt, of Jas. Watt & Sons, Chatham, Ont., has accepted a position with the Dominion Radiator Co., commencing on Aug. 15th.

A mill for the manufacture of all kinds of iron pipe will be erected at Welland, Ont., in connection with the Ontario Iron & Steel Co.

A concern manufacturing arc lights, gas fixtures and coal oil stoves will locate in St. Thomas, Ont., if $10,000 is subscribed by the city.

J. H. James is the latest addition to the plumbing fraternity of Chatham, Ont. He has his office in connection with Jas. A. King's hardware store.

Louis K. Markey, representing the Ideal Mfg. Co., Windsor, Ont., was a caller at the Toronto office of the Plumber and Steamfitter last Friday.

The corner stone for the new engineering building at McGill University, Montreal, was laid recently. The building when completed will cost $275,000.

W. P. Landon & Co., plumbers and metal workers, Saskatoon, Sask., are building an addition in the rear of their workshop in which a reserve stock will be kept.

W. J. Chapman, Kingston, Ont., recently secured the plumbing and heating contract for improvements to St. George's Hall, in that city, and the building of a sexton's residence.

A new plumbing firm has started business in Toronto, under the name of Robinson Bros. The firm consists of E. B. Robinson and G. H. Robinson, late of R. T. Robinson, Toronto.

The Galt Brass Manufacturing Company, composed of local men, is doing a large business. It is expected that the present quarters will be enlarged in the fall, or new quarters obtained.

James Watt & Sons, plumbers, Chatham, Ont., have dissolved by mutual consent. The business will be continued by James and John B. Watt, Thomas Watt retiring from the partnership.

The Canadian Brass Co., Galt, Ont., have their factory almost completed. Most of the machinery, which is of the most approved type, has been installed, and it is expected that operations will be commenced in earnest in about a month.

The Halifax Board of Works has decided to ask for tenders for three thousand water meters, four hundred feet of lead water pipe, and a supply of valves. The meters will be installed in houses as soon after the tenders are accepted as possible.

The city of Regina, Sask., is proceeding with the construction of water mains from the city limits to the Government House, and from there to the R. N. W. M. P. barracks. The work is being done in two sections, and separate tenders were received for each section.

A. J. Jackson, Toronto, has taken over the business of Orlando Vickery, and will have the Ontario agency for Beaver Brand enamelware, manufactured by the Amherst Foundry Co., Amherst, N.S. It is rumored that Mr. Vickery will start a new plumbing supply house.

Illsey Bros., Red Deer, Alta., have recently secured a nice contract which speaks well for the enterprise and success of this hustling young firm. It is for the installation of a steam heating and ventilating system in the Red Deer public school. The specifications call for the Pease-Waldon system.

Moncton, N.B., has accepted the tender of the Canada Iron & Foundry Co., of Londonderry, N.S., for water pipe. The tenders were : R. D. Wood & Co., $13,935.00 ; D. J. Stewart & Co., $12,776.25 ; Singleton, Dunn & Co., $12,384.00 ; Canadian Iron & Foundry Co., $12,592.50 ; Sumner & Co., $12,894.00.

The plumbing and heating contract for the Windsor Hotel, Saskatoon, Sask., has been secured by M. Isbister & Son. The same firm will also install a steam heating system both in the Windsor and in the new addition to the Royal Hotel. In both cases Florence steam boilers are specified, which will be supplied by the Pease-Waldon Co., Winnipeg.

W. H. Meredith, sales manager of the Monarch Brass Mfg. Co., Toronto, left last week on a two weeks' vacation. He and Mrs. Meredith are taking in the Mackinac trip, going via Collingwood and returning via Detroit, Cleveland and Buffalo. In the meantime the Monarch Company are just completing large additions to their plant to enable them to take care of their ever increasing trade.

Wallaceburg, Ont., is beginning to discuss the waterworks question. The Messrs. Winters, surveyors and engineers, are engaged in surveying between the sugar factory and the chenal ecarte, with a view to locating the best route for bringing "Sny" water to the factory. Citizens are urging that the town join hands with the sugar company in bringing in the water and securing an up-to-date waterworks system.

The Canadian Wolverine Co. has been granted a provincial charter. L. A., H. C. and C. W. Cornelius, Grand Rapids, Mich., and Robert Gray and W. H. Westman, Chatham, Ont., are named as provisional directors, the capital stock being $100,000, in 1,000 shares of $100 each. It is expected that the Grand Rapids people will meet in Chatham, Ont., shortly to arrange for the organization of the new company, which will locate there. The company are authorized to manufacture, buy, sell and deal in plumbers' and waterworks supplies, brass, metal and wooden goods and wares, machinery and tools of all kinds. This list affords the concern a pretty wide scope for expansion.

Henri W. Gamachi, a Montreal plumber, twenty years of age, and son of Lieut. Gamachi, narrowly escaped death from fire and gas last week. He was repairing a leak in a gas pipe when he was overcome by gas, and, with a lighted candle in his hand, fell to the floor and set fire to the woodwork of the house in which he was working. A fire alarm was sent in and when the firemen arrived they found the victim unconscious.

As an instance of the way eastern Canada is keeping pace with the growth of the west it may be noted that Amherst, N.S., has doubled its population in the past ten years. In 1896 it was 4,025, now it is more than 8,000. The total assessment ten years ago was less than $2,000,000, while for this year it is nearly $13,250,000. The value of the output of Amherst factories last year was nearly $5,000,000 and over $1,000,000 was paid in wages by the chief industries.

CONTRACTS AWARDED.

The Toronto Board of Education's Property Committee has let the following contracts: Alterations to Jarvis St. Collegiate, plumbing work, Lewis Legrow, $340; heating and ventilating work, Fred. Armstrong & Co., $350; furnace for caretaker's cottage, Pease Heating Co., $105.

Enlargement of Grace St., Pape Ave. and Perth Ave. schools: Grace St.—Plumbing work, F. Armstrong & Co., $850 ; heating and ventilating, W. F. Rutley, $2,179. Pape Avenue School—Plumbing work, Lewis Le Grow, $273 ; heating and ventilating, Rutley & Co., $845. Perth Avenue School—Plumbing work, Lewis Le Grow, $385 ; heating and ventilating, W. F. Rutley, $945.

ALL THE MODERN IMPROVEMENTS.

"Mother, what makes my hair crackle so when I brush it ?" asked the little girl on a clear, frosty morning.

"There's electricity in your hair, darling," was the reply.

"Oh, mother !" exclaimed the little girl, with awe in her voice, "aren't we wonderfully made ! I have 'lectricity in my hair and grandma has gas in her stomach !"

Keep your eye on the man who never makes mistakes.

PLUMBING AND HEATING MARKETS

MONTREAL PLUMBING MARKETS.

Montreal, August 12. Business in local markets is very brisk for this season of the year, and the manufacturers are receiving all the orders they can take care of. All lines are experiencing a good demand, and in one or two cases, namely, brass goods and enamelware, the supplies are hardly adequate. Prices on all lines, with the exception of lead pipe, are firm and unchanged.

Iron Pipe—The advances in prices made on all measurements noted in the last issue of this paper are well maintained. Prospects for trade this season are bright. We continue to quote 1-in. black at $5.60, and 1-in. galvanized, $7.-26.

Lead Pipe—The demand for this is moderate, Supplies are fairly adequate. Prices are firm and unchanged. Lead pipe, 7c.; lead waste, 8c., net list.

Brass Goods—A very heavy demand prevails for all lines. Manufacturers have more orders than they can fill. With the weakness in the copper market owing to the deadlock between buyers and sellers, a possible decline is looked for. It is impossible, however, to speak with any certainty. Supplies in all lines are very limited. The discount on standard compression work is still 57½ per cent., flatway work, 55 per cent. off.

Enamelware The demand for all lines is very heavy, and many large contracts have been closed in Montreal during the past few weeks. The discount on enameled closets and urinals is 15 per cent.

Cast Iron Fittings—The factories are busy; demand is steady and prices firm. The discount is still 57½ per cent.

Solder—Half-and-half guaranteed bar is quoted at 25 cents per pound; wiping, 22 cents. Demand is moderate.

Metals Market conditions in local circles are comparatively quiet. Some activity is experienced in the pig iron market. Large enquiries during the past week have been received. Copper is weak. Leading producers have not yet settled on any definite prices. We continue to quote at $23.50. Lead is very firm at $5.75 for bar. Pig iron is strengthening. Prices are unchanged. Middlesboro, No. 1, $21.50; No. 2, $20.-50; Summerlee, $25.50. General dullness prevails in old metals. Prices are weak: Heavy copper and wire, 17c.; light copper, 16c.; heavy red brass, 15½c; heavy yellow brass, 12c.; light brass, 8½c.; heavy lead, 4c.; scrap zinc, 3¾c.; No. 1 wrought iron, $15.50; No. 2, $6.

TORONTO PLUMBING MARKETS.

Toronto, Aug. 12.—During the past fortnight business in the local plumbing markets has fallen off to a considerable degree and the usual midsummer quietness has settled on the trade. The Toronto plumbers and steamfitters' strike has now been on for three months and as yet there is no settlement in sight. While the strike has not thus far affected the local market to the extent that an outsider might suppose, nevertheless it is useless to deny the fact that the protracted struggle is holding up a considerable amount of local trade and jobbers would certainly be glad to see the trouble amicably settled.

Iron Pipe.—The demand for pipe is still strong; many sizes are still difficult to procure, but on the whole supplies have slightly improved. There has been no further change in price since the recent advance and quotations remain firm at the following figures: ¼-in. black pipe, $2.90; ½-in. galvanized, $3.75; 1-in. black, $5.60; 1-in. galvanized, $7.25.

Soil Pipe.—A good average business is being done and, on account of present low prices, many dealers have stocked up well in this line in order to have a supply on hand should the manufacturers stop slashing each other and agree to sell at higher prices. Supplies are quite adequate to meet all needs and prices are still unchanged: Medium and extra heavy pipe and fittings, up to 6-inch, 70 per cent.; 7 and 8-inch pipe, 40 and 5 per cent.; light pipe, 50 per cent.; fittings, 50 and 10 per cent.

Solder and Lead Pipe.—Both are in fair demand; lead pipe has taken a slight decline and is now quoted at five per cent. off, instead of net list. Wiping solder is still quoted at 23c. per pound.

Compression Work, Etc.—Compression work is still quoted at 57½ per cent. and fuller work is held at 65 per cent. off list. The figures for ground work run as follows: Bibbs, 45 per cent.; roundway work, 50 per cent., and flatway work, 55 per cent. off list.

Cast Iron Fittings.—A fair demand exists, and prices remain firm at 57½ per cent. off list.

Enamelware.—Price cutting has apparently ceased, and as many buildings are now nearing the stage when lavatory fixtures are needed, an increased demand for bathroom enamelware is now in evidence.

Metals.—Lead has undergone a slight decline in the local market during the past week, and imported pig lead is now quoted here at $5.35 instead of $5.50. The demand for lead is limited and the market is extremely dull. Since the decline of last week there has been no change in local copper prices, which remain comparatively steady at the reduced figures. Concerning the American market, it is noticeable that the consumption of copper has slackened up a bit there, but the decrease is fully compensated by the declining production. Business continues quiet in Old Materials, consequently further reductions in price have taken place during the week. Heavy copper and wire has declined ¼c. and is now quoted at 16c.; light copper has dropped one cent and is now quoted at 14c.; heavy red brass has lost 1½c., and the market price is now 13½c.; yellow brass and light brass have each declined 1c. and are now quoted at 11c. and 7c. respectively; tea lead is ¼c. lower and is now quoted at 3¾c. Iron and steel remain quiet, and although no general decline has been made, still the fact that one large local jobber is quoting ingot tin from $43.50 to $44, shows that the tendency of the market is downward.

NEW BRASS FACTORY.

The Turner Brass Works of Chicago, have completed their new factory at Sycamore, Ill., and are now occupying it. The main factory building has a floor space of 40,000 square feet, with power and heating plants additional. Improved machinery has been installed and their facilities enlarged and greatly improved. They are located on the main line of the Chicago & Great Western Ry. and the Galena division of the Chicago & Northwestern Ry., with sidetracks to the factory. As soon as completely settled, all orders will be shipped promptly. All correspondence and orders should be sent to the main office, Sycamore, Ill.

CONDENSED OR "WANT" ADVERTISEMENTS.

Advertisements under this heading 2c. a word first insertion; 1c. a word each subsequent insertion.

Contractions count as one word, but five figures (as $1,000) are allowed as one word.

Cash remittances to cover cost **must** accompany all advertisements. **In no case** can this rule be overlooked. Advertisements received without remittance cannot be acknowledged.

Where replies come to our care to be forwarded, five cents must be added to cost to cover postage, etc.

FOR SALE

FOR SALE—First-class set of tinsmith's tools, second hand but almost as good as new; includes an 8-foot iron brick, almost new. Apply Pease-Waldon Co., Winnipeg.

HARDWARE, tinware, stove and plumbing business in manufacturing town in the Niagara Peninsula; no competition; $250,000 factory and waterworks will be completed this summer; stock about $3,000; death of owner reason for selling. Box 85, Thorold, Ont.

PLUMBER'S Cabinet for sale, cost $75, stands nine feet high and is 6 feet wide, contains 68 drawers, ranging in size from 3 in. x 3 in. to 6 in. x 18 in. Am installing larger cabinet, otherwise would not think of selling. Box 649, Plumber and Steamfitter, Toronto.

BUSINESS CHANCES

WANTED—Partner to take half interest in one of the best hardware propositions in Algoma; plumber preferred. Box 636, Plumber and Steamfitter, Toronto.

OFFICE space wanted by manufacturer in Toronto: state location and terms. Box 645, Plumber and Steamfitter, Toronto.

THE WANT AD.

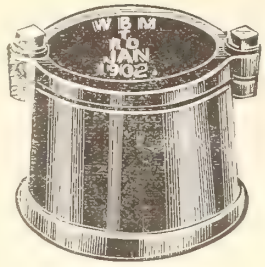
The want ad. has grown from a little used force in business life, into one of the great necessities of the present day.

Business men nowadays turn to the "want ad." as a matter of course for a hundred small services.

The want ad. gets work for workers and workers for work.

It gets clerks for employers and finds employers for clerks. It brings together buyer and seller, and enables them to do business, though they may be thousands of miles apart.

The "want ad." is the great force in the small affairs and incidents of daily life.



Malcolm's Cleaning Screw

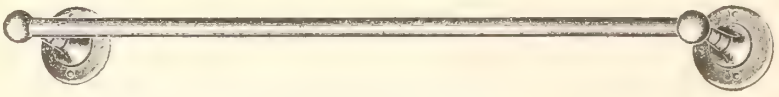
The cheapest and best in the market.

A TIME SAVER

The cover can always be removed with ease.

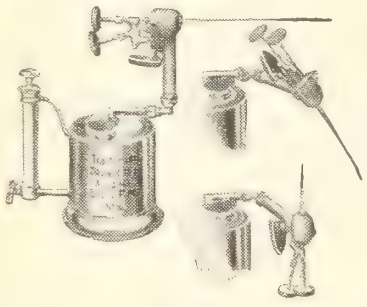
MALCOLM & CO. - Toronto

High-grade Bathroom Fixtures



ARE MADE IN CANADA BY

The Carriage Mountings Co., Limited, Toronto

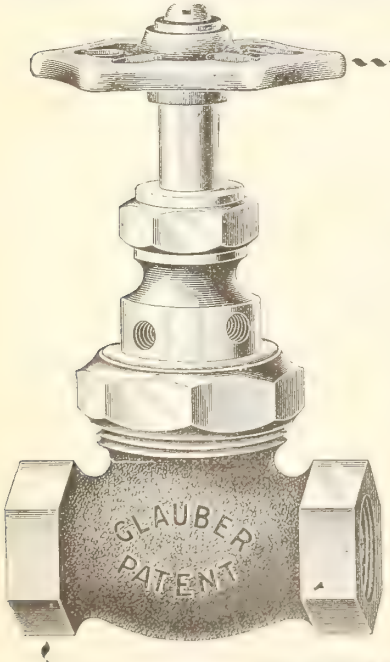


HOTTEST ON EARTH

The No. 8 Alcohol Blow Pipe produces nearly 3000 F. Will do lead burning on storage batteries. Produces a needle blue flame pointed. Satisfaction guaranteed or money refunded. Jobbers sell at factory price, **$9.75 net.**

THE TURNER BRASS WORKS

53 PARK AVENUE, SYCAMORE, ILL.



Automatic

SELF DRAINING COMPRESSING

STOP AND WASTE COCK

The Only Self Draining Cock Made

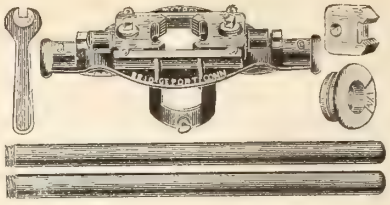
Patent Features, Two holes in bonnet—Upper hole for air—Lower hole for waste—insures perfect circulation and automatic drain, no matter in what position cock is installed.

Interchangeable right or left. Quick operating stem. Made to stand Boiling Water as well as Cold.

GLAUBER FIVE YEAR GUARANTEE PROTECTS YOU

A Trial Dozen Will Make You Order More

CLEVELAND, **GLAUBER BRASS MFG. CO.** OHIO



The Armstrong Manufacturing Co.

317 Knowlton St., - Bridgeport, Conn.

Manufacturers of the Genuine Armstrong Stock and Die, Malleable Iron Hinged Vises, Pipe Cutters, Pipe Wrenches, Bard Adjustable Bushings, Ratchet Attachment for Stock, Pipe Threading and Cutting-off Machine--Hand and Power. Our goods are sold by all Jobbers.

CATALOGUE MAILED ON REQUEST

If you can use High-grade Low Down Compression Basin Cocks with China Index Handles, ask for the Acme Brass Works Nos. 4, 5, 6 and 7 Basin Cocks, which are just what you want. They are the acme of perfection in style, workmanship and durability.

Write us to-day.
Do not delay for to-morrow.

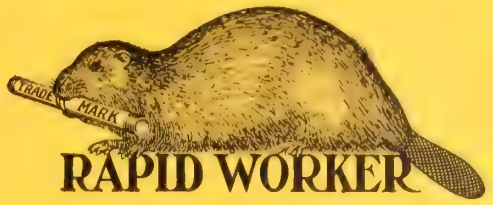
Acme Brass Works

CLEVELAND, O.

Let Our Beaver Do Your Work.

You Don't Have to Change Dies.

Cuts 1, 1¼, 1½ and 2" perfect threads, all with one set of chasers



RAPID WORKER

The Hand Stock that Starts Easy and Finishes Easier.

"The New Way."

You Will Find it a Sure-enough Beaver.

Write for our special 10-day trial offer

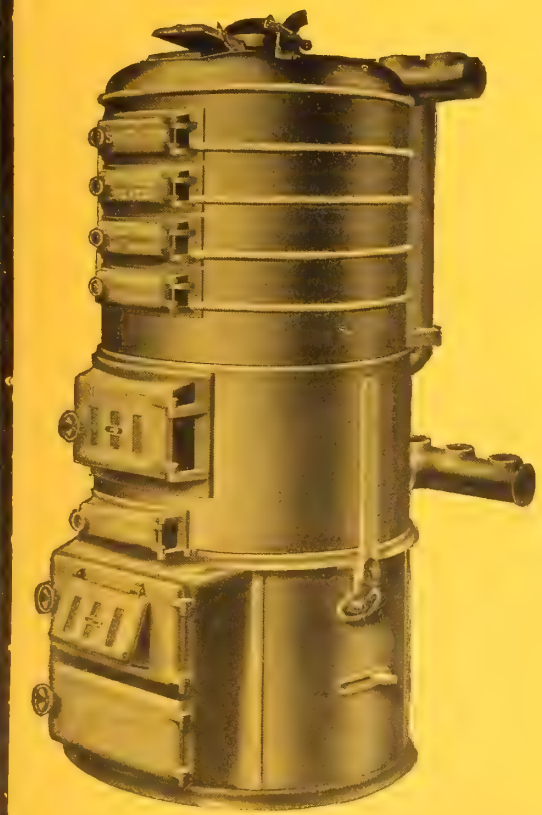
You cannot afford to take the time to thread pipe by hand in any other way

Other sizes of Beavers will be born soon—¼ to ¾—2½ to 4—4½ to 8—8 to 12.

Manufactured by

Borden-Canadian Company

166 Adelaide Street West, Toronto



A PERFECT HEATING SYSTEM

A perfect Heating System provides the maximum of heat with the minimum of expense. Incidentally that explains the unprecedented success of "SOVEREIGN" BOILERS.

We do not claim to make the only good boiler on the market—but—and this is important—most practical men declare that the "SOVEREIGN" BOILER is representative of all that is best and most economic about heating systems.

It certainly does pay to recommend the "SOVEREIGN."

Taylor-Forbes Company,

LIMITED

Head Office and Works: GUELPH, ONT.

TORONTO—1088 King St. West. MONTREAL—122 Craig St. West
WINNIPEG—The Vulcan Iron Works, Limited

To the Plumbing Trade

Good advertising pays. We will furnish you the accompanying cut and reading matter for your use in local papers free on application.

You Must Order Through Your Plumber.

Standard Ideal Porcelain Enameled Ware is never sold direct. Made in Canada, this ware is the equal of the best foreign products.

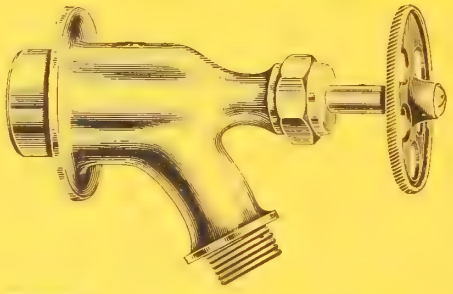
Standard Ideal Porcelain Enameled Ware is handsome in design, durable in construction, moderate in cost. Ensures perfect sanitation.

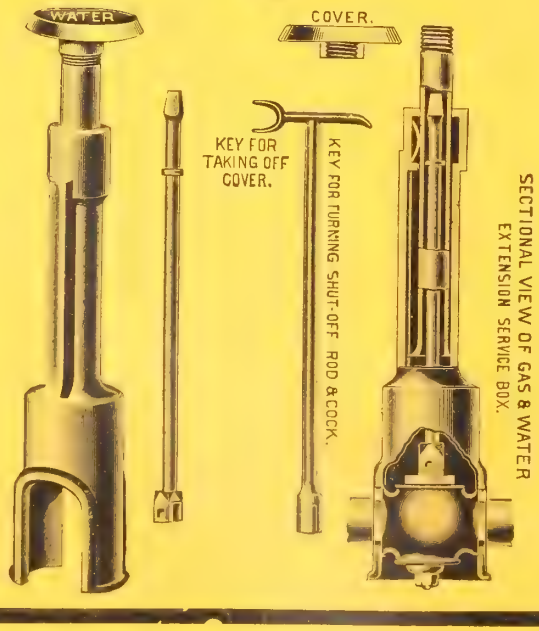
We will be pleased to install Standard Ideal Porcelain Enameled Ware in your home.

JOHN BLANK & CO.
Plumbers and Steamfitters

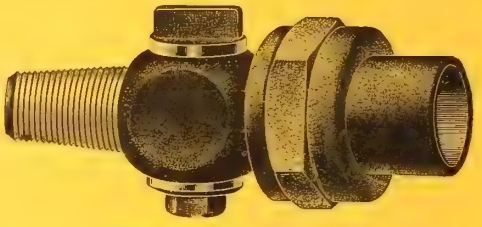
STANDARD Ideal COMPANY, LIMITED

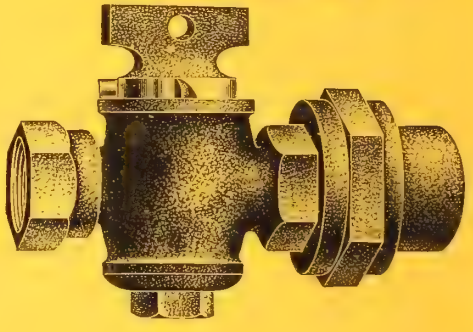
Head Office and Factories: PORT HOPE, ONT.





Fittings That Don't Disappoint





For

Plumbing, Water, Gas and Steam

Hays Manufacturing Co.

Complete Works: - - - ERIE, PA., U.S.A

CONVENTION NUMBER

PLUMBER & STEAMFITTER OF CANADA

THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

MONTREAL 232 McGill St. TORONTO, 10 Front St. E. WINNIPEG, 511 Union Bank Bldg. LONDON, ENG., 88 Fleet St. E.C.

Vol. I. No. 10. (New Series). Publication Office : 10 Front St. East, TORONTO, AUG. 28, 1907. Old Series, Vol. XIX. No. 20

THE DAISY STANDS ON ITS MERITS

Daisy

We claim a great many things for the DAISY HOT WATER BOILER—that it is the oldest heater manufactured in Canada—that it is giving universal satisfaction—that there are more of them in use to-day than all other makes combined—but what we assert the strongest is that genuine merit has been the secret of the DAISY'S unprecedented popularity.

A FEW OF THE FINE POINTS.

Quality of metal, practical design and high grade of workmanship.

Horizontal circulation.

The perfect grate, combining strength with easy shaking and dumping the ashes.

Write for Catalogue.

Our stock of Steamfitters' and Plumbers' Supplies covers the largest range in Canada. We make every effort to ship orders sent by mail the day they are received.

CLUFF BROTHERS

LOMBARD STREET, TORONTO

SELLING AGENTS FOR WARDEN KING & SON, Limited

New "Agrippa" Fittings Wrench

More work, more convenience, more usefulness! A tool for tight places. No more troubles with short nipples and flange connections. One powerful jaw does it all and does all kinds of work. They will save a busy man 2 hours a day. Practically no wear and ready for all kinds of business all of the time. Made after 25 years of experience in the celebrated "Vulcan" Chain Pipe Wrench and Vise and tried several years before marketing. Your kit is crippled ⅓ if you are without a Williams "Agrippa." Made for all sizes of fittings.

Try your dealer now. Our man is in your territory. Dealers, get your supply of free printed matter at once.

J. H. Williams & Co.

Superior Drop Forgings

BROOKLYN

N.Y.

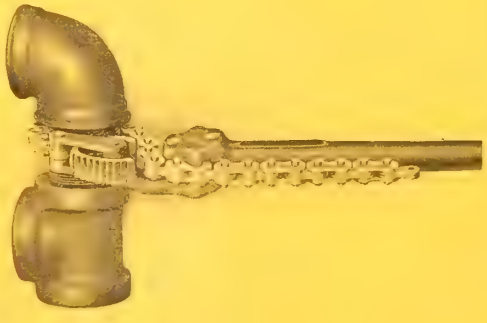


Plate 558E.—Push Button Self-closing Faucet
China Index Top

Plumbers' Brass Work

ALL THE

LATEST STYLES

PROMPT DELIVERY

SOMERVILLE LIMITED

59 RICHMOND STREET EAST - TORONTO

EXHIBITION VISITORS

We invite our many friends visiting Toronto during the Exhibition to make our offices on Lombard Street their headquarters during their stay in the city.

Our various representatives will be present to assist us in receiving our out-of-town visitors and we extend you a hearty welcome.

CLUFF BROTHERS

Lombard Street, TORONTO

Selling Agents for WARDEN KING & SON, Limited

Monarch is "King."

MOST PLUMBERS USE

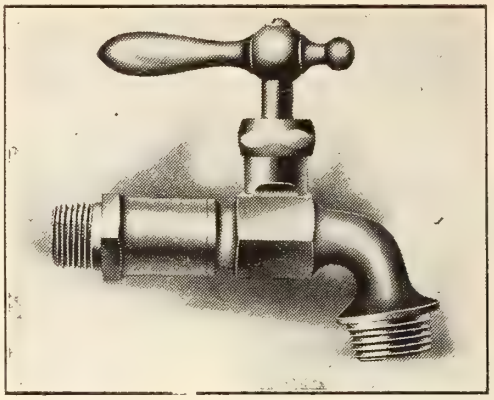
"MONARCH"

goods. All should.

Those who do, appreciate their worth; those who don't are the losers.

A Trial Order is Solicited

so we may have an opportunity to convince you of these facts.



FULLER COCKS

FULL LINE

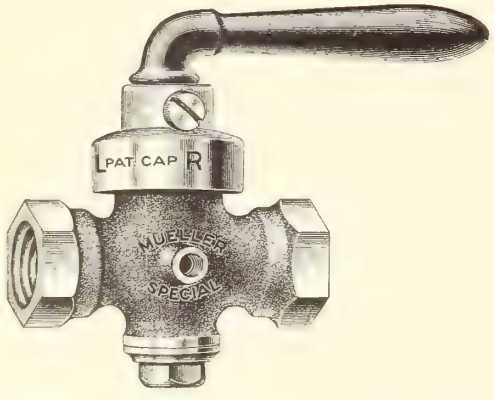
COMPRESSION COCKS

QUICK-OPENING VALVES

The Monarch Brass Manufacturing Co., Limited

Factory: Port Colborne, - Ont.

Office and Warehouse: 278 Dundas St., - Toronto



These goods are made in all styles of pipe connection, all sizes and with Emameled Iron Lever Handles or Galvanized Malleable Iron Tee Handles. Only the best red brass is used, and each cock is tested with 200 pounds hydraulic pressure.

Every Plumber Wants to do Good Work

If he will add to his mechanical skill goods of Quality, he will succeed in his desire and have satisfied customers as well. We have the means to this end in our complete line of

Mueller Patent Cap Stop and Waste Cocks

The patent cap protects the ground surfaces from all foreign substances, and keeps the cock in perfect working condition all the time. Interchangeable from right to left by a quarter turn of the cap.

Write for Prices and Literature

TRADE MARK MUELLER REGISTERED

H. MUELLER MFG. CO.

Works and General Offices
DECATUR, ILL.
West Cerro Gordo Street

Eastern Division
NEW YORK CITY
254 Canal St., cor. Lafayette.

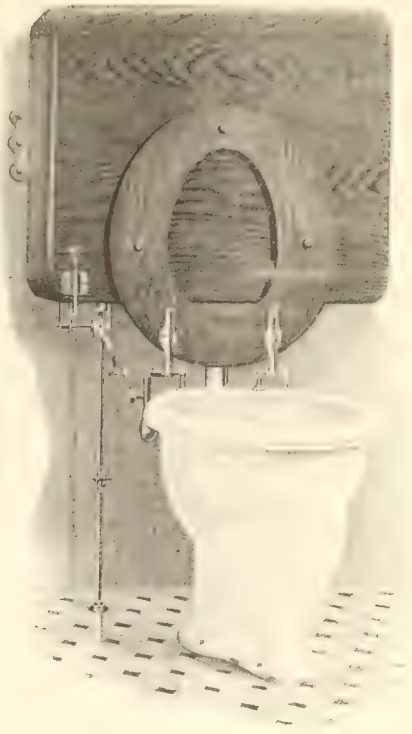
"ROYAL" PLAIN WASH-DOWN COMBINATION.

"Royal" Low-Tank Combinations

Are Fit for any Bathroom

ARCHITECTS SPECIFY THEM

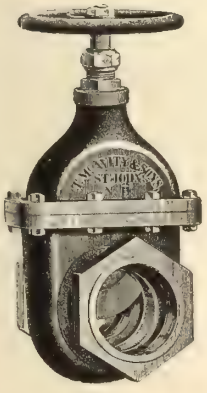
THE BEST PLUMBERS INSTALL THEM

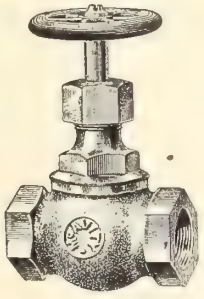


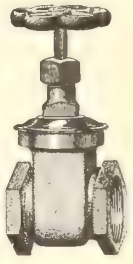
NO. 08 "ROYAL" (AUTOMATIC) COMBINATION.

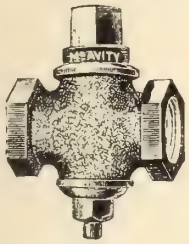
This Combination is especially adapted for use in Schools, Hotels, Railway Stations, Factories and places where Closet is also used as a Urinal.

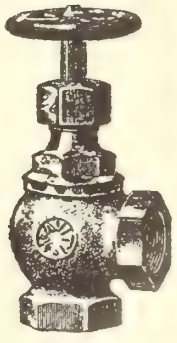
McAVITY VALVES AND FITTINGS











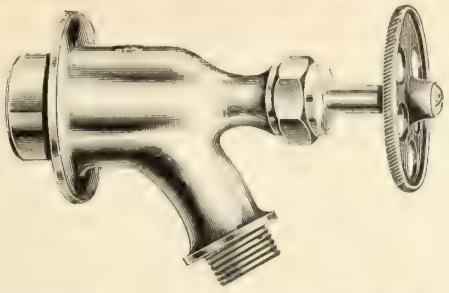
T. McAVITY & SONS, ST. JOHN, N.B.

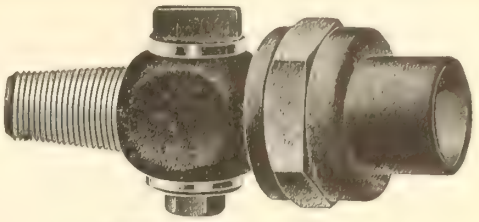
ROBERTSON'S MARBLE LAVATORIES

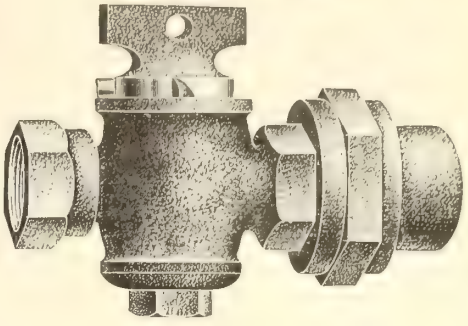
In addition to the goods illustrated, we manufacture and carry in stock a full line of staples, such as Brass Compression, Fuller and Ground Work, Soil Pipe and Fittings, Iron Pipe and Fittings, Engineers', Gasfitters', Steamfitters' and Mill Supplies. A Catalogue for each of these departments will be cheerfully forwarded on application.

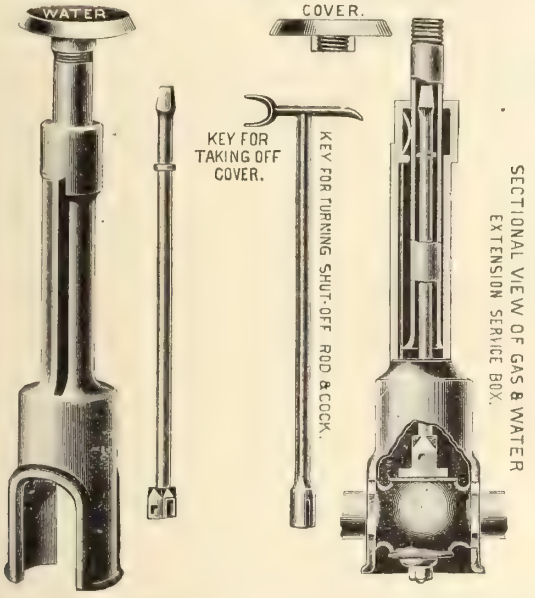
The James Robertson Company, Limited

265 King Street West, TORONTO









Fittings That Don't Disappoint

For

Plumbing, Water, Gas and Steam

Hays Manufacturing Co.

Complete Works: - - - ERIE, PA., U.S.A

What Class of Men do You want to Reach?

We presume you want the largest number of responses possible from the best class of people. This cannot result through using only local mediums.

Did you ever stop to think how many Plumbers and Steamfitters read any one of our large dailies? If you have a business for sale or wish to engage a clerk you will not be content to have your advertisement seen by men in any one locality. THE PLUMBER AND STEAMFITTER is not a Montreal, Toronto or Winnipeg paper. It is an ALL CANADIAN NEWSPAPER, and reaches each week practically all the men engaged in the Plumbing and Steamfitting trades from the Atlantic to the Pacific. Your message will be carried **quickly.** THE PLUMBER AND STEAMFITTER is mailed the second Wednesday of each month. On Thursday all subscribers in Ontario should receive their copy, and by the end of the week your message will have been read by practically ever Plumber and Steamfitter from Halifax to Vancouver.

Rates: 2c. per word first insertion
1c. " " subsequent insertions.

PLUMBER AND STEAMFITTER

MONTREAL TORONTO WINNIPEG

Books for Plumbers & Steamfitters

Principles and Practice of Plumbing

BY J. J. COSGROVE

This is an up-to-date, exhaustive work on plumbing and sanitation. It is a practical book for practical men. The subject matter is clear and concise. The object of the author has been to systematize the principles that underlie the practice of plumbing, and give accurate rules and formulae for designing plumbing installations for large buildings. The table of contents also includes

Water Supply Systems,
Hot Water Supply, and
Plumbing Fixtures.

Bound in Cloth. - Fully Illustrated.

Price $3.00, Postpaid.

Sanitation in the Modern Home

By JOHN K. ALLEN

This book is an invaluable guide to the architect, plumber, heating engineer and house owner, telling just what is necessary to make a house completely sanitary from sub-soil to the roof. It contains eighteen chapters. The subjects of five are the following :

What a Modern Housekeeper Wants,
Heating by Steam,
Heating by Hot Water,
Hot Water Supply,
Lighting the Home.

Bound in Cloth, - 272 Pages.

Price $2.00, Postpaid.

Plumber's Catechism

Theory and Practice of Plumbing Design

By CHAS. B. BALL

This book formulates, in question and answer form, the fundamental principles of plumbing design and practice, crystallizing the knowledge of the skilled plumber, and provides the non-technical reader a source of information as free as possible from puzzling set phrases. The contents include :

Plumbing Fixtures,
Water Service Pipes,
Design of Pipe Systems,
Pumps,
Effects of Freezing.

Bound in Cloth. - Elaborately Indexed.

Price $1.00, Postpaid.

Swimming Pools

By JOHN K. ALLEN

This is a practical guide, treating of the construction of Swimming Pools, Cold and Hot Water Supply, Various Methods of Heating the Water, directions as to selecting correct sizes of heaters. The contents include :

Determining Grate and Heating Surface required,
Hot Water Heating Capacity,
Heating by Feed Water Heater,
Mechanical Installation,
Methods of Heating,
Overflow,
Location of Pools, etc.

The only book published treating on this subject.

Bound in Cloth. - Over 30 illustrations.

Price 50c., Postpaid.

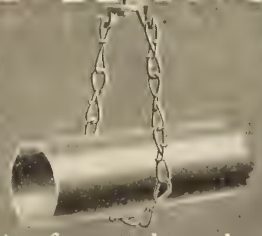
TECHNICAL BOOK DEPARTMENT

THE MACLEAN PUBLISHING COMPANY

MONTREAL TORONTO WINNIPEG

NIAGARA CHAIN *for* PIPE HANGING

Most convenient and neatest as well as the most economical hanger on the market.

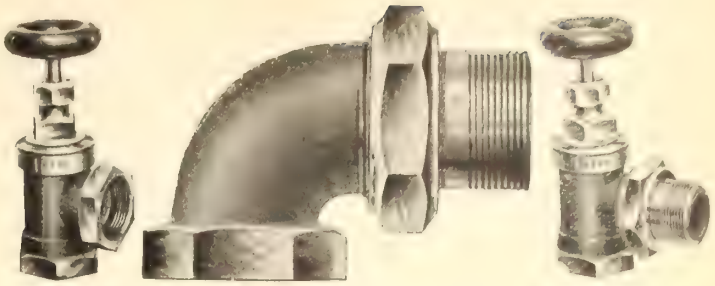


Pipe may be hung any distance from ceiling with this hanger.

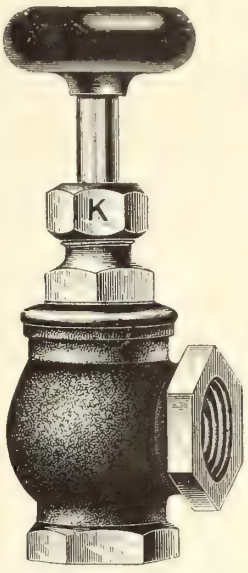
Permits of easy and exact adjustment.

Write for samples and prices.

ONEIDA COMMUNITY, Ltd.
NIAGARA FALLS, ONTARIO.



Steam & Hot Water Fitters



who handle KERR VALVES are the leading men in their line.

You should use Kerr valves for they improve your reputation for high-class work.

Made by a long established and responsible firm.

WRITE FOR CATALOG

THE KERR ENGINE CO.
Valve Manufacturers
LIMITED
WALKERVILLE, ONT.

Backed by a Guarantee

All our **Bronze** Powders and **Liquids** have the distinction of being **Guaranteed.** All plumbers and steamfitters know the necessity of having the **Best** in Bronze Powders and Liquids.

OURS NEVER FAIL

The Canadian Bronze Powder Works

MONTREAL—TORONTO

No order too large Works at Valleyfield

If your nearest dealer does not keep our goods, write us.

M.R.M. CO.

WROUGHT PIPE

Black and Galvanized

All sizes, 1-8 to 12 inches, carried in stock.

Our pipe is made from the very best quality of soft, weldable Strips, and every length is tested to 500 lbs. per square inch hydraulic pressure.

When ordering pipe specify "M.R.M."

MADE BY

The Montreal Rolling Mills Company

M.R.M. CO.

Courtesy of "Modern Sanitation"

The Bath

Awarded first prize in the Pittsburg Carnegie Institute Exhibition.

The Plumber and His Trade Paper

No trade or profession requires a live trade press more than the plumbing and steamfitting trades. Doctors need a medium for the exchange of ideas, just as do other classes of men doing similar work, but their university training, their frequent consultations and their many opportunities of learing modern practice and methods makes it much easier for them to do without trade papers than the plumbers and steamfitters who have, as a rule, left school at an early age, spent a few years in the rough work of an apprentice and have been more drawn to recreation than to study.

Consequently plumbers and fitters require a trade press which will accomplish the two-fold purpose of supplying the news of the trade and acting as a medium for the exchange of ideas on trade subjects. In the United States splendid work has been done by such papers as the Plumbers' Trade Journal, Domestic Engineering and the Metal Worker, and the men in the trade throughout the country have learned to use thecolumns of these papers in discussing problems arising during their daily work. In this way the knowledge possessed by readers of the trade press has been enlarged and the standard of work done has been noticeably improved.

* * *

In Canada the limited field for operations has made it necessary for Canadians to look to the New York and Chicago trade papers, both for trade news and technical knowledge, but with the remarkable development on this side of the line since the beginning of the century it was considered opportune this this spring to establish a Canadian paper for the plumbing and heating trades. The venture has met with unexpected support; in fact, during the twenty odd years of experience in the trade newspaper field of The MacLean Publishing Company, no paper has ever met with such a universal welcome as has been given The Plumber and Steamfitter. Already it can be found in practically every establishment in Canada where plumbing and heating contracts are figured on, our subscription canvassers reporting work on this paper an "easy proposition." The publishers desire to thank the trade for the liberal support extended the staff of The Plumber and Steamfitter, and repeat again that the paper is at the service of the trade, both in extending trade knowledge on technical subjects and in assisting in the work of trade organization.

* * *

A general invitation is extended to all in the trade to forward questions to be answered by our staff, and to send short articles for publication, illustrated where possible by sketches, no matter how rough they may be.

The opening up of the west and the north country adds to the complex heating and sanitation problems peculiar to the country north of the Great Lakes and one time called "Our Lady of the Snows." These problems can best be discussed and solved by Canadian writtrade papers from the States, there is an undoubted field for work by a Canadian paper. The publishers are providing the publication and look for the co-operation of the practical men in the trade, both in the cities and back districts in making The Plumber and Steamfitter of the greatest possible value to the trade.

NEW OFFICERS OF NATIONAL M. P. A.

Past President—F. G. Johnson, Ottawa.
President—John Watson, Montreal.
Vice-President—Joseph Laurier, Montreal.
Secretary—H. A. Knox, Ottawa.
Treasurer—Harry Mahoney, Guelph.
Provincial Vice-Presidents—
Ontario—Charles Taylor, Brantford.
Quebec—J. E. Walsh, Montreal.
Nova Scotia—F. Dexter, Truro.
New Brunswick—H. Dryden, Sussex.
Manitoba—A. J. Hammond, Winnipeg.
Alberta and Saskatchewan — E. J. Young, Calgary.
British Columbia—Bert Weeks, Vancouver.
Chairmen of Committees—
Legislation—H. J. Chandler, Ottawa.
Apprenticeship—J. A. Thibeault, Montreal.
Sanitary—L. Legrow, Toronto.
Essay—G. A. Wootten, Halifax.
Organization—H. McCauley, Montreal.

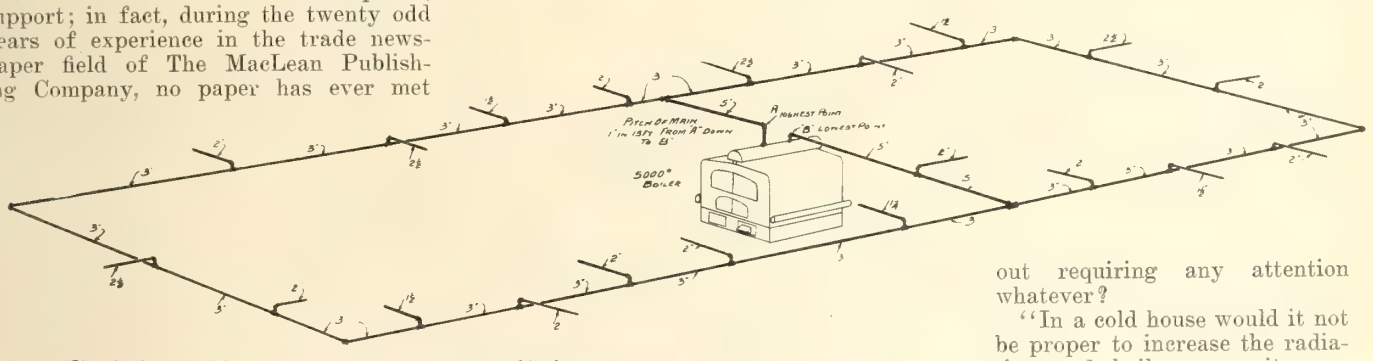
We have received the accompanying drawing from a correspondent in Westers and without relaxing interest in the ern Canada who asks what is the matter that it will not work. The mains are plenty large enough, as there is only some 3,500 feet of radiation on the job. The boiler has 5,000 feet capacity and there are no traps whatever in any of the pipes. The flow starts at the point "A," the highest in the system, and then splits into two three-inch mains, having a fall of one inch in every fifteen feet, finally coming together and returning at "B" into the top of the boiler.

Correspondence is invited from readers on this problem, it being the editor's desire to establish a department of "Questions and Answers," commencing with the next issue of the paper.

* * *

Another query which will receive attention in the next issue is the following from "J. E. W.," Ailsa Craig, Ont., who writes:

> "Here is a question asked by one of my customers on which I would like information from some reader of your paper:
>
> "Take, for instance, a No. 3 Daisy boiler, with a capacity of 1,500 feet of 1-in. pipe, capacity exclusive of mains, which would mean about 500 square feet of radiators, sufficient to heat a house of thirteen or fourteen thousand cubic feet under favorable conditions.
>
> "Supposing we would place a No. 5 Daisy boiler in place of the No. 3, would it be as economical as fuel? Could it be left for fourteen or sixteen hours without requiring any attention whatever?
>
> "In a cold house would it not be proper to increase the radiation and boiler capacity as well?"



Sketch showing job in which return comes into top of boiler with no return pipe into the return headers below the waterline.

* * *

Our technical book department makes an announcement on another page which is worthy of attention. Plumbers and steamfitters should establish a library for reference, and in doing this our technical department can serve Canadians better than any other concern, as we buy from every publisher and can supply books at net prices, customers avoiding all trouble of passing books through the customs department.

PLUMBER AND STEAMFITTER OF CANADA

The MacLean Publishing Co.
Limited

JOHN BAYNE MacLEAN - - - President
W. L. EDMONDS - - - - Vice-President
H. T. HUNTER - - - Business Manager
WESTON WRIGLEY - - - Managing Editor

Publishers of Trade Newspapers which circulate in the Provinces of British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, Nova Scotia, New Brunswick, P. E. Island and Newfoundland.

OFFICES.

MONTREAL - - - - - - 232 McGill Street
Telephone Main 1525
TORONTO - - - - - - 10 Front Street East
Telephones Main 2701 and 2702
WINNIPEG - - - 511 Union Bank Building
Telephone 3726
LONDON, ENG. - - - - 88 Fleet Street, E.C.,
J. Meredith McKim
Telephone, Central 12960

BRANCHES

CHICAGO, ILL. - - - - 1001 Teutonic Bldg.
J. Roland Kay
PARIS, FRANCE - Agence Havas, 8 Place de la Bourse
MANCHESTER, ENG. - - - - 92 Market Street
ZURICH, SWITZERLAND - - - Louis Wolf
Orell Fussli & Co.

Subscription, Canada and United States, $1 00
Published Twice Every Month
Cable Address { Adscript, London / Adscript, Canada

CHEAP MATERIALS MEAN CHEAP WORK.

Cheap plumbing materials are expensive, for the plumber who is unwise enough to use them must ultimately lose trade and business standing. The amount of business lost will more than offset any temporary advantage gained through the use of inferior goods. And in view of the final reckoning, there can be no justification for the use of shoddy materials, hardly capable of serving even as makeshifts, for which purpose they were designed.

Goods made to answer the purpose only until the consumer pays for them are bound to cause endless trouble and annoyance. Some other plumber is usually called on to remove the defective materials and replace them with high-grade goods. Meanwhile, the whole trade suffers because of the unfavorable public opinion created by the short-sighted policy of the plumber who for various reasons is led to use materials of inferior quality.

The consumer may suffer most at first, points out the Metal Worker, but in the end it is the plumber that pays the penalty for the lack of judgment displayed.

Only when there is an extensive and insistent demand for price reductions that necessarily and unfavorably affect the quality of the goods supplied are manufacturers as a general rule willing to cheapen their products. Hence, responsibility for the existence and use of cheap material cannot be lightly shifted from plumbers to manufacturers, who must be guided largely by the law of supply and demand. There would be little inferior plumbing material on the market if there were no demand for it.

Unfortunately for themselves, too many plumbers have required a habit of substituting second grade materials whenever it is evident that customers are not sufficiently well informed to know the difference between the quality specified and that installed. Sometimes the deception is never discovered, but it frequently happens that customers are enlightened by friends, and then fixtures and materials must be torn out and replaced. The work of replacement is annoying to the customer and not only unprofitable to the plumber, but responsible for a lack of confidence in the plumber, expressed and unexpressed.

Cheap wearing apparel and cheap household goods may be bought and used without injury to the consumer in particular or the public in general, but the use of cheap plumbing materials is not only a menace to the health of the individual consumer, but to that of the whole community.

The wise plumber who makes it a practice always to use good materials constitutes himself a guardian of the public health, and as such ranks with and should possess the respect accorded to the conscientious physician.

ONE BIG LEAK.

Profit oozes out of many places. One of the largest leaks is sprung by taking on big quantities because an extra five or an extra ten off is given.

If you can use the goods within a reasonable time the extra five or ten represents a saving, but if it means carrying a surplus stock a long way into the future it is more likely to mean a loss.

More burdens have been piled on the shoulders of retailers by these extra discounts than by any other method.

It is one form of over-buying which has brought countless victims into the bankruptcy court. More merchants make mistakes in quantity in their buying than go wrong on price.

When you face that extra five or that extra ten look at the quantity. First consider how long it will last you. If it carries you too far into the future let it go. You will lose money on any long-winded deal, no matter what the discount.

Aluminum is hard to restore to its first beauty, especially the frosted finish. Immerse for a considerable time in water slightly acidulated with sulphuric acid.

THE NATIONAL CONVENTION.

The convention of the National M.P.A., held in Montreal last week, was in every respect, but one, the best in the history of the Association, in the opinion of one of the oldest and most active officers of the organization. The one regrettable feature was the almost complete absence of representatives from the Ontario cities, and the failure of certain officers to send reports of the work assigned to them.

The convention took wise action in adopting new rules providing for the acceptance of office by officials, by appointing a national chairman to act with the Provincial Vice-Presidents in the work of extending the organization, and in deciding to appropriate a sum of money for the use of the chairman of the Sanitary and other important committees, who find it necessary to incur expense in order to properly perform the duties of their positions.

A wide scope for work is open for the Sanitary Committee in communicating with the hundreds of municipalities throughout Canada regarding the adoption of new or improvement of existing sanitary regulations and if this work is carried out in a proper manner (the chairman being exceedingly well chosen for the work), it will do much to place the National Association in the position of importance it deserves. If the public, municipal councils and boards of health can be made to understand that the master plumber is a public-spirited individual, desirous of safeguarding the public health, the mistaken and prevalent opinion that he is a highway robber practicing extortion upon every fly entering his parlor, may be dissipated.

In Ontario the work of organization should be pushed during the coming year, a Provincial convention being held not later than Good Friday. Plans can easily be drafted for an organization, which, while leaving out the illegal and objectionable features condemned a year or so ago, will be able to do effective work for the trade.

The Plumber and Steamfitter congratulates the National Association on the capable body of men selected to carry on the association work during the coming year, and trusts that when the convention meets in Toronto or Western Ontario, next August, that not only Ontario, but Manitoba and the Western Provinces will have delegates present to make satisfactory reports showing progress in these sections of the country.

Should Intercepting Traps be Compulsory

J. E. Dore, City Sanitary Engineer, Montreal, Condemns Intercepting Traps in Convincing Language

In the April 17 issue of the Plumber and Steamfitter, an excellent article appeared from the pen of M. M. O'Connell,—plumbing inspector of Ottawa—on this question. In it the writer's opinions were very clearly expressed and sound arguments were brought forward to support those opinions. This is a question of great interest tp plumbers and others directly interested in practical sanitation, and also to others whose only interest in sanitary questions is just so far as their own health is concerned. On this account we are glad to be able to publish other leading sanitarian's opinions on this question, and the opinion of J. E. Dore, City Sanitary Engineer of Montreal, which he is kindly allowing us to publish, is worthy of careful consideration, and is of great value. Some two years ago the city of Winnipeg was suffering from an epidemic of typhoid fever, and E. M. Woods of the Board of Health of that city, wrote to J. E. Dore for his opinion as to whether any of the causes of the epidemic could be attributed to the intercepting trap, which was in general use in that city. To that letter Mr. Dore replied as follows :—

Winnipeg's Typhoid Epidemic.

Dear Sir—In reply to your communication of the 21st inst, I beg to state that if I knew, or if I had seen the City of Winnipeg, I could give you an opinion stating facts and reasons ; an opinion of a more positive character than this one. Yet, as the intercepting trap forms part of your drainage system, I do not hesitate to say that it is the main cause of the epidemic of typhoid fever afflicting your community at the present moment.

The observations I have made, the cases I have met with in the course of my duties for the past thirteen years, have convinced me that the intercepting trap is a nuisance, being more accentuated in cold climates where the ground is frozen and covered with snow for many months of the year. The intercepting trap prevents the circulation of air in the sewer, where air is indispensable for the oxidation and transformation of the sewage ; also, the gases produced by the decomposition of the contents of the sewers are the more charged with germs likely to produce infectious diseases as they are the more confined. The trap prevents the dangerous gases formed in the drain from escaping by the soil pipe through the roof where they would come in contact with the pure air, and the dangerous elements would be dispersed. The air confined in the sewer by the trap is forced to escape by the gulley at the street level, contaminates the atmosphere, which, entering the houses is respired by the occupants.

In cases in which the gulleys are covered with snow and ice and the ground frozen, the gases in question force their way through the less hard strata which have been upturned in the process of excavation, and thus reach the interior of houses. I have met with very many such cases in the City of Montreal.

Yours faithfully,

J. E. DORE.

In this letter Mr. Dore expresses his opinion equally clear against the use of the intercepting trap as did Mr. O'Connell, in favor of the trap. Mr. Dore also uses much clear reasoning in favor of his opinion. The fact that men with experience, such as these have both, differing opinions upon the question, shows how important is the matter and the need of its being intelligently discussed in the limelight of experience, that a right solution may be attained. Further, is this letter Mr. Dore when asked for his professional opinion on this matter by his own health committee of the City of Montreal reported chiefly as follows :—

Report to Health Committee.

The question must be treated from the point of view of public health, and we must start from the recognized standpoint that the sewers should be well ventilated, in order to facilitate the rapid oxidation of the contents. The researches and experiments made by the German and English commissioners, the results of which have been given in the "Gesundaheits Ingeineur," and reproduced by the English journals, show that the ventilation of the main sewers is only possible by means of numerous openings. This is why in Europe and especially in England, 'manholes' with perforated covers are found at distances of about 200 feet apart in the streets. Thus the air of the street is more or less contaminated ; and yet, it is this air that is not only inhaled in the street but also entering the houses by the doors and windows is breathed by the occupants.

Is not the system of continuing the house drain through the roof by a ventilating pipe, preferable, as by this means the sewers are better and more generally ventilated. This system is all the more necessary in a city like Montreal, where for a considerable part of the year all the openings in the streets are covered by ice and snow. If the sewer gas in place of discharging into the street is carried to the roof, and then into the atmosphere, it is evident that it is thus more diluted and becomes necessarily less dangerous.

Protecting the Householder.

From the point of view of the householder is the intercepting trap a protection ? The fundamental principle of drainage is to ensure the prompt removal of sewage to the farthest possible distance from the house before decomposition begins. Those who understand the principles of hygiene, know that the intercepting trap retards the flow of the sewage, and retains it so much that frequently traps are found choked, and no one can tell how long they have been partially so. The consequence of the arrest of sewage is fermentation, and moreover, analyses have shown that the air of such private drains is more dangerous than that of the public sewer.

In accord with Mr. Baylees, Mr. Folwell who has written a treatise upon sewage says :—

> "But a still better circulation of air is obtained by omitting the main trap altogether and permitting the air from the sewer to pass through the house connection unobstructed. The danger of this air passing the traps on house fixtures is no greater than that of the soil pipe air doing the same, and in the majority of cases the sewer air is the less dangerous. Such construction is also of great assistance in ventilating the sewer, etc.

Let us look at the matter from the standpoint of equity as well as of public health. Are not all the inhabitants of a city obliged to contribute their share towards ensuring the ventilation of the public sewers whatever that may be—by the construction of manholes, etc., or by the house soil pipes. It is all the same from that standpoint so nothing can be argued on that point in favor of the intercepting trap.

Fresh Air Inlet a Nuisance.

Again, regarding the fresh air inlet which in modern practice is used in connection with the intercepting trap, it is certainly a nuisance when it is not absolutely useless, as this inlet has been added to the trap in order to try to obviate the nuisance of which the latter is the primary cause. The fresh air inlet is not a success. It does not prevent the fermentation of the contents of the trap. It is supposed to create an ascending current of air which would carry off the vitiated air through the roof. But all persons acquainted with practical hygiene (and myself by experience), know that the air current in the soil pipe is not always upward. On the contrary, I have often seen the foul air acted upon by the wind or by the flushing, discharge through the fresh air inlet. This proved that if there were an opening in the soil pipe at any point throughout its length, the vitiated air would find its way out through the same before reaching the air inlet.

The Public Statutes of Massachusetts (the best regulated state of the union in this matter), do not mention this system, which fact is more than significant.

The whole respectfully submitted.

J. E. DORE.

We can add nothing to these clearly expressed views of the City Sanitary Engineer of Montreal, but remark that they are the opinions resulting from experience of one of the few highest authorities of this country.

Master Plumbers' National Convention

Representative gathering in Canada's commercial metropolis—From Halifax to Winnipeg delegates assemble—Many important subjects discussed—Strong set of officers elected.

The twelfth annual convention of the National Association of Master Plumbers, Steam, Gas and Hot Water Fitters of Canada, held in Montreal on August 21, 22 and 23, eclipsed anything of its kind held in recent years, indicating that association work is by no means on the wane in Canada, but is, instead, awakening from the era of quietude prevailing in several sections during the past couple of years. Some of the reports were by no means satisfactory, life not having yet been infused into some of the sleeping locals, but there was no question about the wide-awake character of the Montreal Convention.

This year's meeting represented a far wider constituency than the convention in Ottawa a year ago, when no delegates were present from east of Montreal. This year Halifax, Truro and Moncton sent delegates. The representation from the west was hardly as strong as a year ago, however, although Winnipeg, Guelph and Brantford men were present. Much disappointment was expressed at the failure of Toronto, London and Hamilton to send representatives to outline the real situation existing in these cities. Before another annual convention is held a better condition of affairs should materialize.

The boys gathered on Wednesday morning in the Plumbers' Hall, 90 St. James street, Montreal, the executive going into session early and keeping hard at work until President F. G. Johnson of Ottawa, called the opening session to order at eleven o'clock. In his opening remarks Mr. Johnson expressed his pleasure at seeing such a good representation present, welcoming particularly the older men, one of whom was John Date, honorary president of the Montreal Association, who over sixty years ago was wiping joints when few of the others present had yet seen the light of day. He thanked the members for their support during the past year, stating that the duties had not been very heavy, although some important matters had been dealt with. The power of association work, said the president, is gradually extending, and plumbers should be alive to the modern idea of men working in one line getting together for mutual protection and trade advancement.

Harry Munday, Montreal, was appointed seargent-at-arms and Messrs. G. A. Wootten, Halifax; Harry Mahoney, Guelph and Joseph Laurier, Montreal, credential committee. Adjournment was then made until 2 p.m. to allow the credential committee to do its work.

Group of Delegates, Supply Men and Ladies, at the 12th National Master Plumbers' Association Convention.
Taken at Montreal on Thursday, Aug. 22, 1907.

Those Present.

Montreal (delegates). — W. R. J. Hughes, J. E. Walsh, Joseph Laurier, Joseph Thibeault, R. J. McCauley (W. J. McGuire & Co.) and James Griffin.

Montreal (officers, alternates and visitors).—John Watson, J. A. Gordon, J. Date, J. W. Hughes, Harry Munday, D. Dugas, J. A. Kyle, Nap. Turcot, L. R. Bourbonière, J. C. Denman, Z. Cusson, R. Sevigny, Joseph Lamarche, P. C. Ogilvie, T. Christie, Thomas Moll, A. Galorneau, L. J. Conroy, Walter Ryan and A. C. Barber.

Ottawa.—F. J. Johnson, H. A. Knox and H. L. Chandler.

Guelph.—Harry Mahoney.

Brantford.—Charles Taylor.

Halifax.—G. A. Wootten.

Truro, N.S.—Frank Dexter.

Moncton, N.B.—Wm. Watson.

Winnipeg.—R. H. Lear.

Weston Wrigley, Toronto, representing the Plumber and Steamfitter; F. H. O'Connor, jun., New York, representing the Plumbers' Trade Journal.

Representatives of Supply Houses.

Amongst those noticed at the different gatherings were:

James Robertson Co., Montreal: Alex. A. Robertson, John J. Corcoran, Wm. Greig and J. O. Bernier.

Warden, King & Son, Montreal: Louis Payette, R. J. Cluff and W. Rodden.

Taylor-Forbes, Guelph: R. I. McLaren and Harry J. Moulden.

Gurney-Massey Co., Montreal: R. J. Lockhart and Jas. F. L. Carron.

Dominion Radiator Co., Montreal:

Peter McMichael, J. B. Morris and F. Rawley.

Maison Jean Paquette, Montreal: Odessa Paquette, Thomas J. Carlind, M. Pelletier, M. Comte and Joseph Bell.

Monarch Brass Co., Toronto: W. H. Meredith.

Thomas Robertson & Co., Montreal: S. R. Brewer and H. A. Lamontagne.

Canada Radiator Co., Lachine: F. J. Travers, F. Outram and E. P. Matte.

Cuthbert & Co., Montreal: Lyon Cohen.

R. C. Miller, Montreal: J. L. Flanders.

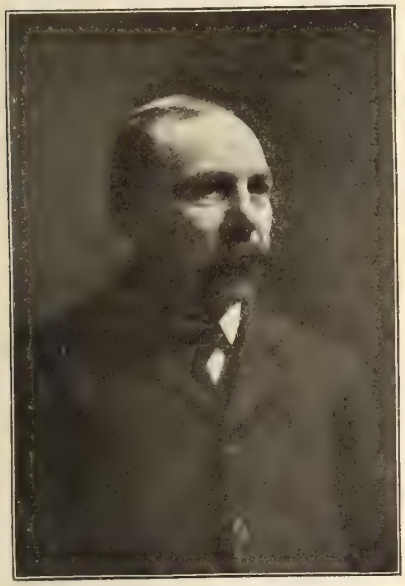
Wm. Powell & Co., Cincinnati: C. E. Vance.

Canadian Fairbanks Co., Montreal: H. L. De Wolfe.

J. R. Martin, manufacturer's agent, Montreal.

WEDNESDAY AFTERNOON.

The second session commenced at 2.30 p.m., the first business taken up being a motion by Messrs. Mahoney and John Watson, that the representatives of The



JOHN WATSON, MONTREAL,
Elected National President by Acclamation.

Plumber and Steamfitter, Toronto, and The Plumbers' Trade Journal, New York, be accorded the privileges of the association during the convention.

The credential committee reported the filing of credentials of delegates from Montreal, Ottawa, Guelph, Brantford, Halifax, Truro, Moncton, Winnipeg and Quebec.

A press committee, composed of John Watson, J. E. Walsh and Joseph Thebeault, were appointed to act with the representatives of the press.

A select committee, composed of Messrs. W. R. J. Hughes and Charles Taylor, was appointed.

The resolutions committee, including H. A. Knox, J. E. Walsh and Joseph Laurier, were named.

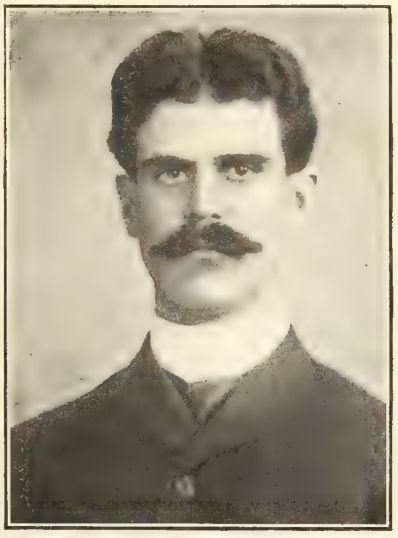
An invitation to be the guests of the Maison Jean Paquette was received and accepted.

The reports of the various officers were then read and referred to the resolutions committee.

President's Report.

To the delegates and members of the twelfth annual convention:

It is my duty, and I esteem it a pleasure to greet you all on the event of another birthday of this, our twelfth annual convention, in view of all the trouble our association has passed through which we have successfully weathered, and this should remind us that our association possesses the power to shape its own destiny. We are to define the limit of its greatness, and each member has felt himself a cog in the wheel of action. Let us continue on for the national association, and while it does appear just now that some of our



JOSEPH LAURIER,
The new National Vice-president, representing the French Membership on the Executive Committee.

progress has been classed illegal, still there is every reason why we should hold together for social intercourse, and for our general benefits. I am pleased to say that the business of the national association has been carefully and successfully carried on through the past year, and glad to say I have not recorded a single complaint being brought up to my notice. I have, therefore, every reason to be proud of our association work.

It is my pleasure to report that the business of the country is prosperous, every manufacturer being pushed to his utmost to fill his orders. This, in turn, offers a good demand for skilled labor, and at a much advanced salary, and the master plumber of to-day is called upon to bear a considerable burden of increased expense in his business management.

I find the attendance of our local association has been anything but good, and I would impress on all to interest themselves in local work, for the time is coming when no master plumber can lose his identity. Besides, it is the only means whereby difficulties can be adjusted, and good will be promoted.

I regret that I am unable to report any new associations being formed. I have at all times endeavored to further the case of our association with new firms opening up business. As soon as I hear of one, I lay a report of our work before them, and in many cases I have met with favorable replies.

Regarding the incorporation of the national association, I have given this personal attention, and would again refer this to the present convention to take some further action, with regard to the cost of same.

During my term I have had the pleasure of receiving and replying to some thirty letters and communications, and in the interest of the association I have replied fully to them. In some cases I have extended invitations to meet with us, and will gladly welcome all such who attend this convention.

One very noticeable condition of business affairs is the recognition by the manufacturers and jobbing houses of unfair competition. I claim no individual, or firm, should be considered as a jobber, when he employs workmen

H. A. KNOX, OTTAWA.
The new National Secretary.

and competes against these bona fide master plumbers, and I believe that the manufacturers should see that each town and city use up as much of the manufactured articles, and whether it is sold by the maker, jobber, or local dealer, the consumption is the same. It is then for the master plumbers as a whole to protect their own interests by confining their trade to those who are trustworthy and faithful to the man that puts up the goods, and assumes all risks. This body expects every member to play this part.

I am pleased to say that our country is now awaking to the general necessity of enforcing the method of sanitation. Many of the smaller towns along the St. Lawrence and Ottawa Rivers have been disposing of their sewage by dumping it into the river. Where a proper set of plumbing bylaws is enforced, and

such laws are imposed to regulate the same, confirming the work of the national association as a whole, I can, with pride, point out the many improvements, and hope in the future to know that our labor has not been in vain.

Respectfuly submitted,

F. G. JOHNSON, President.

Ottawa, August 19.

HARRY MAHONEY, GUELPH.
Re-elected National Treasurer.

Vice-president's Report.

I take pleasure in submitting my annual report to the twelfth convention of your honorable body, and thank the members for the honor conferred on me, by electing me your vice-president for the year just past.

I must comment on the uphill work it has been for your officers for the past two years. Their work has been very difficult and discouraging, but I am now of the opinion we have surmounted a great many of the difficulties and can see a very bright future before us. With the able officers you have elected and good advice they will submit in their annual reports, I have no doubt that the next convention will be one of the best.

All my available time for the past year has been principally taken up with work in connection with our Montreal local association. We are still about the same number of members as last year, holding out meetings weekly and organizing on a good solid base.

I would suggest to this honorable body that they recommend to the different local associations the following items:

(1)—Establishment of trade schools, with plumbing, heating and ventilation classes, locals to offer prizes for best results to apprentices.

(2)—Local library containing all books and trade papers.

(3)—Lectures to local associations at least quarterly.

The apprenticeship question should also be taken into consideration and the present apprentice agreement adopted or amended to suit each province.

I also wish to draw attention to the alarming number of general contractors who are competing through the width and breadth of our fair Dominion. I think that this is unfair competition and master plumbers should refuse to become mere sub-contractors, allowing the general contractor to carry off any profit in the work.

I trust the visiting delegates will enjoy themselves while in Montreal, and in conclusion, would urge upon the members to continue the good work, and endeavor to build up this asosciation as an example to all.

Respectfully submitted,

JOHN WATSON, Vice-president.

Montreal, August 20.

JOHN A. GORDON, MONTREAL.
Who is retiring from the Secretaryship, after several years' good work.

Secretary's Report.

In presenting my report of the work done during the year 1906 and 1907, I regret that the honorable and responsible position to which I was elected has not entailed a greater amount of work. The past year has not been an onerous one as you will readily see from the small amount of correspondence, viz., nineteen communications received and answered, twenty-two letters written in repy to various questions and eighty-nine circular letters sent out relative to the present convention, in an attempt to create a greater interest and enthusiasm in our association, of which every master plumber in our Dominion should be proud to be a member, and I trust that my efforts have not been without some result, even if it is not visible just at the present.

Respectfully submitted,

JOHN A. GORDON, Secretary.

Montreal, August 20.

Treasurer's Report.

The treasurer's report showed assets amounting to $588.05, with liabilities of $210.90, leaving a balance to the credit of the organization of $377.15. The auditors reported that this balance was found correct.

Report of Sub-executive.

Accounts for printing the annual reports of the Ottawa convention were as follows:

Dr.	
Printing, A. P. Pigeon	$142 00
French translation	25 00
Commission for advertisement	38 75
Postage and exchange	13 22
	$219 57

Cr.	
Receipts from advertising	$210 00
Receipts from arrears, 1905	30 00
	$240 00

Balance to credit of association, $20.43.

Respectfully submitted,

John Watson.
J. Lamarche.
John A. Gordon.

Montreal, August 20.

Nova Scotia's Report.

It affords me much pleasure herewith to submit to your honorable body a report of the workings and condition of affairs pertaining to the welfare of those engaged in the plumbing business in the province which I have the honor to represent.

The past year had been very much the same as preceding years, no great advances made, but the advances, small though they may appear, are more of a permanent nature and I trust will bring forth good results.

F. G. JOHNSON, OTTAWA.
Retiring President of the National Association.

It affords me pleasure to inform you that the Halifax Association is making headway and good feeling exists between the different members thereof.

having been taught by experience that organization is the only means whereby any progress can be made.

Trade has been fairly good in my district, but profits, due to keen competition, have been in no way commensurate with the amount of work done. This is to be regretted.

The manufacturers and jobbers, so far as can be learned, are living up to their promises, selling to plumbers only, acknowledging that it is for their best interest to do so. During the past year

A. J. HAMMOND, WINNIPEG.
The new Vice-president for Manitoba.

I have corresponded with every master plumber doing business in this Province and Cape Breton, thereby endeavoring to obtain knowledge of their methods in conducting their business, and also to receive an expression of opinion in connection with association matters. With a few exceptions, the answers received have been very satisfactory.

At present there is nothing that I can suggest for the advancement of the association, and trust that the forthcoming convention may be the means of bringing forth good results for one and all.

Yours respectfully,

G. A. WOOTTEN,
Vice-president for Nova Scotia.

Halifax, August 19.

Report From Northwest.

As provincial vice-president, I regret to state that there is nothing doing here in association matters.

There was a strike this spring over the apprentice question and the extreme regulations and rules demanded by the union. This was finally settled, however, by an arbitration board of the builders' exchange, who made concessions on both sides. The minimum rate of wages for plumbers and steamfitters was put at 51½ cents per hour.

The local master plumbers have formed a plumbers' board of trade to handle the labor question, and other matters that may come up affecting us as a body. There are nine firms now in Calgary, and business is feeling the stringency in the money market.

I wish you a successful and well attended convention, and regret that I am unable to be present this year.

E. J. YOUNG,
Vice-president for Alberta and Saskatchewan.

Calgary, August 14.

B. C. Vice-president's Report.

I am sorry to have to report that we have had no association meetings since 1905. Previous to that we had meetings from time to time, but we did not hold together. The benefits which we received during the time we had our provincial organization makes me believe strongly in organization, as at the present time we are experiencing the closest kind of competition in which none of us are making any money. We are using our brains and losing our time.

Respectfully submitted,

A. J. WEEKS,
Vice-president for British Columbia.

Vancouver, August 10.

Sanitary Committee's Report.

Your Sanitary Committee seizes this occasion to refer to the purpose for which it stands, the creation of good plumbing laws and the enforcement of them. This is easily spoken of, but to work them out involves patience, application and self-sacrifice. While there are new territories opening up, wherein good plumbing work should be called for, there are still many places in the older settlements in which the work of raising the plumbing standard is before them.

Fort William inquired for particulars to frame a plumbing by-law.

Your committee expected to lay before you returns from every municipality in every Province in the Dominion, showing the plumbing laws that are in operation. This meant considerable labor and expense, and was not carried out. We suggest on behalf of the welfare of the National Association that some provision should be made to compensate and to encourage the chairmen of committees to further the work of the association.

The Chairman of the Sanitary Committee, with the work before him, will be one of your busiest officers. Don't neglect or under-estimate it, but allow him what material his work needs. We cannot impress too forcibly this point. For twelve years your Sanitary Committee has had nothing but enthusiasm to sustain it, and in view of the immense labor before this committee, we respectfully suggest that provision be made at this convention to carry it on.

Respectfully submitted,

H. L. Chandler,
E. B. Butterworth,
J. Levock,
J. R. McLenan.
H. A. Knox.

Ottawa, Aug. 16.

Legislative Committee's Report.

I regret that the condition of the trade in this section during the past two years has made it impossible to do anything in the way of legislation.

The public in general is down on the poor plumber, and no argument will convince them that we are anything but legalized robbers.

Regretting my inability to attend the 12th convention, and wishing you all every success, I remain, etc.,

HUGH WALLACE,
Chairman Legislative Committee.

Hamilton, Aug. 12.

All of the reports were referred to the Resolutions Committee for consideration.

Proxies for Absent Officers.

The following were chosen as proxies for the Provincial Vice-Presidents not present at the convention, on motion of Messrs. Mahoney and Laurier:

Charles Taylor, Brantford, for Ben Noble, London.

J. E. Walsh, Montreal, for D. Shea, Fredericton, N.B.

H. A. Knox, Ottawa, for Bert Weeks, Vancouver.

P. C. Ogilvie, Montreal, for E. J. Young, Calgary.

F. Dexter, Truro, under new business, suggested a change in the constitution relating to the electing of Provincial Vice-Presidents, but it was announced that the Executive already had this matter under consideration.

The meeting adjourned at 4.30 p.m. and went in a body to Lachine by train, returning by boat through the Lachine

LEWIS LEGROW, TORONTO.
Elected Chairman of the Sanitary Committee.

Rapids, an exciting and pleasant trip, enjoyed by every delegate and lady present.

THURSDAY MORNING.

The convention reassembled at 10.30 a.m., President Johnson appointing Messrs. Frank Dexter, Truro; Chas. Taylor, Brantford, and John Watson,

Montreal, as a Nominating Committee. and Joseph Thibeault, Montreal; H. A. Knox, Ottawa, and R. J. McCauley, Montreal, as an Auditing Committee, after which reports from the Sanitary Committee and some of the Provincial Vice-Presidents were read, and on motion adopted or referred to the Resolutions Committee.

A recommendation from the Executive Committee that the National Association elect the Provincial Vice-Presidents allowing each to select two assist-

G. A. WOOTTEN, HALIFAX,
Elected Chairman of the Essay Committee.

ant workers to act with him on organization matters, the sum of $25 being allowed for expenses, brought out an extended discussion on the whole question of Provincial Vice-Presidents, it being contended that the President system could be improved.

John Watson advocated the reference of the whole matter to a special committee. The National Association was organized on too loose a basis, no real chartered membership existing.

H. A. Knox felt that the present constitution covered the matter, referring to how the question had been threshed out a few years ago in an argument between the British Columbia Provincial Association and the Vice-President for that Province. He favored trying the Executive's recommendation for a year and leaving the matter in their hands.

Harry Mahoney favored Mr. Watson's idea of issuing charters, pointing out that if an association existed in Guelph it was not affiliated with anything, under the present situation with no Provincial organization.

P. C. Ogilvie reminded the delegates of the issuance of certificates to individual members by the National Association a few years ago. He favored issuing charters, local secretaries to report a full list of members to the National Secretary. He saw no benefit to be derived from individual certificates, however.

A motion by Messrs. John Watson and G. A. Wootten, that the recommendation be adopted and passed on to the Executive to be worked out, was carried.

The meeting adjourned at noon to allow the committees time to prepare their reports.

FRIDAY MORNING.

The convention assembled at 10.30 a.m., the first business being the report of the Select Committee, which recommended that all officers hand in reports at least two weeks before the date of the convention. The secretary is to register all communications to ensure receipt of letters. Sharp criticism was given different officers for failure to perform their duties. Officers chosen by the convention are to be notified at once, and if no reply is received within thirty days, a new official will be appointed by the executive. The committee also suggested that a special effort be made to organize the associations in Toronto and other Ontario cities. The report was adopted.

Resolutions Committee.

The Resolution Committee's report was read by H. A. Knox and taken up clause by clause.

The first clause recommended that the incorporation of the association was inopportune and commended the report regarding certain master plumbers being classed as supply houses and given a preference. Supply houses should not compete with the ordinary tradesman. This was adopted.

The committee also commended the suggestions of the vice-president regarding trade schools and classes, trade papers in libraries, lectures on trade subjects, drafting of apprenticeship agreements, etc., and condemned the practice of general contracting as inimical to the best interests of the trade. No remedy however, was considered available until all locals are thoroughly organized, steps toward which should at once be taken.

Congratulations were tendered the secretary for his earnest and good work.

The Nova Scotia report was considered a model to be patterned after by other provinces, and Vice-president Wootten was congratulated for his good work. The reports of the other provinces were also discussed by the committee with no particular comment other than to condemn the inactivity of the vice-presidents for Ontario, Quebec and Manitoba, who failed to send in reports. The legislation committee's report offered nothing for comment.

The apprenticeship and essay committee also made no reports for consideration by the resolutions committee.

The sanitary committee's report was praised and it was recommended that the suggestion that renumeration be given chairmen of committees be concurred in.

Reference was also made to the favorable report made by the sub-executive committee. The only point discussed at length was the recommendation that finances be provided committees to conduct their work. Mr. Knox referred to the possibilities of valuable work in the way of circularizing every municipality in Canada asking if sanitary by-laws are in existence and urging the adoption of such if not yet established. He cited the case of Fort William, which in adopting health by-laws secured copies of other cities' by-laws through a local plumber's courtesy. He felt that the chairmanship of some committees was of more importance than the provincial vice-president's work.

The whole report was adopted with the exception of the sanitary committee's clause.

An amended report of the sanitary committee was handed in, allowing $25 per year to this committee for its work. This was adopted by the convention.

The usual honorarium of $100 was granted the secretary, covering the work and expense of his office.

The convention decided to send a letter of condolence to the widow of the late W. J. Stevenson, a prominent association member who recently passed away at Guelph.

A vote of thanks was tendered the Montreal Association for the use of its rooms as a convention headquarters.

The nominating committee reported by making the following recommendations :

F. J. Johnson, Ottawa, past president.

John Watson, Montreal, president.

J. A. Gordon, Montreal, vice-president.

H. A. Knox, Ottawa, secretary.

Harry Mahoney, Guelph, treasurer.

Provincial Vice-presidents.

Ontario.—Chas. Taylor, Brantford.
Quebec.—J. E. Walsh, Montreal.
Nova Scotia.—F. Dexter, Truro.

WM. WATSON, MONCTON, N.B.,
The new President's Brother, who for Years has been active in Association Work in New Brunswick.

New Brunswick.—H. Dryden, Sussex.

Manitoba.—A. J. Hammond, Winnipeg.

British Columbia.—Bert Weeks, Vancouver.

Alberta and Saskatchewan. — E. J. Young, Calgary.

Chairmen of Committees.

Legislation.—H. J. Chandler, Ottawa.
Apprenticeship. — J. A. Thibeault, Montreal.
Sanitary.—L. Legrow, Toronto.
Essay.—G. A. Wootten, Halifax.
The committee recommended that registered notice be sent to all officers elected, any declinations to be filled by the new executive.

FRIDAY AFTERNOON.

The convention reassembled at 2.30 and considered a motion that an organization committee be named with an

NAPOLEON TURCOT,
President of the Montreal Association.

appropriation of $25 to use in pushing their activities. Messrs. Laurier and Walsh strongly advocated the suggested work, while others felt that the work should be left to the vice-presidents. Mr. Taylor felt that the experiment would be worth trying. The motion that the new president appoint Mr. McCauley as chairman of the proposed organization committee, was carried.

Next Year's Convention.

The selection of the place where next year's convention will be held was left to the incoming executive, the members to be notified three months in advance. Some talk of selecting St. John, N.B., was heard, but the majority favored Western Ontario as being more central. Toronto, Hamilton and London were all named, but no definite selection made. Had delegates been present from Toronto there is no question about that city having secured next year's gathering, but if conditions are favorable the Queen City will secure the convention in any case.

Supply Men Heard.

A delegation of supply men was introduced, composed of R. J. Lockhart, Gurney-Massey Company, Montreal; W. Rodden, Warden King Company, Montreal; Peter McMichael, and B. J. Morris, Dominion Radiator Company, Toronto and Montreal; W. H. Meredith, Monarch Brass Company, Toronto; Alex. A. Robertson and W. Greig, James Robertson Company, Montreal; J. R. Martin, manufacturers' agent, Montreal; R. J. McLaren and H. J. Moulden, Taylor-Forbes Company, Guelph; E. Matte, Canada Radiator Company, Lachine; S. R. Brewer and H. Montague, Thos. Robertson Company, Montreal; Odessa Paquette, Tom Carlind and Jos. Ball, Maison Jean Paquette, Montreal.

The different members of the delegation spoke briefly expressing their desire to work in harmony with the master plumbers in putting the trade on a profitable basis to all concerned. They had tried to make the stay of the delegates in Montreal pleasant and trusted that their efforts had been successful.

President Johnson replied to the friendly addresses, stating that he had heard no complaints of unfair doings on the part of the jobbers. He thanked the supply men for their cooperation in making the convention a success so far as the entertainment features were concerned. He hoped that the existing good feeling would continue.

Election of Officers.

The report of the nominating committee was then taken up clause by clause, the only change being the selection of a vice-president to represent the French delegates who, owing to an oversight, had unfortunately been left unrepresented on the list submitted to the convention.

F. G. Johnson, Ottawa, became past president by virtue of his retiring from office.

John Watson, Montreal, was elected president by acclamation.

Messrs. John A. Gordon and Joseph Laurier, Montreal, were nominated for vice-president. Mr. Laurier was elected.

H. A. Knox, Ottawa, was elected unanimously after John A. Gordon and J. C. Walsh, Montreal, had declined to stand. Mr. Knox made a neat speech in accepting the election, promising to serve to the best of his ability and asking the support of the delegates in the work of his position during the coming year.

Harry Mahoney, Guelph, was nominated for treasurer, but declined to stand again. After considerable urging Harry accepted the duties again midst the singing of "He's a Jolly Good Fellow."

The nominations of the vice-presidents and chairmen of committees was then continued, with no change from the nominating committee's recommendations.

A vote of thanks was extended to the trade press for their presence and their efforts in advancing the work of organization and to the supply houses for the generous way in which they entertained the visiting delegates and the aid which they gave to the local association.

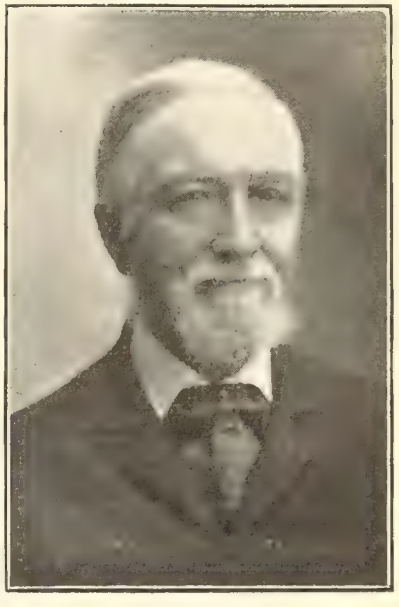
The new president, John Watson, was installed and after the singing of "Auld Lang Syne" and the National Anthem, the twelfth annual convention of the National Master Plumbers' Association came to an end.

Splendidly Entertained.

Thanks to the good work of the convention committee under the leadership of H. A. Lamontagne, the popular salesman representing the Thomas Robertson Company, and J. E. Walsh, the able secretary of the Montreal association, backed up in their work by a live committee and by the generous donations of the supply houses, the entertainment provided at this year's national convention eclipsed anything on record at plumbers' conventions in Canada and if the gathering is held in Toronto next year the Torontonians will have a hard mark to beat.

Through the Lachine Rapids.

First of all was the trip by train to Lachine and the ride down the rapids on one of the safe and commodious steamers accustomed to make this exciting trip. Safely on board the large steamer the visitors to the convention could enjoy the excitement without participating in the danger of a trip down the river on a small boat.



JOHN DATE.
Honorary President of the Montreal Association and for 63 years connected with the trade in that city.

The Theatre Party.

On Wednesday evening the convention party, composed of master plumbers and supply men, with their ladies, attended the new Bennett Theatre and were treated to a fine programme of vaudeville, greatly enjoyed by all.

After the theatre about 30 accepted the invitation of Maison Jean Paquette to visit the Star Iron Foundry offices,

where an impromptu banquet was enjoyed, President Johnson calling on those present in turn to help make the programme enjoyable. "Tom" Carlind, Eastern Ontario representative of the house of Jean Paquette, was master the house of Jean Paquette, was master of ceremonies, Mr. Odessa Paquette incidentally announcing that his firm intended making a strong bid for the trade of his follow Canadians speaking the English tongue. He also announced that the growth of their business had been so great as to necessitate further ex-

JOSEPH LAMARCHE, MONTREAL,
One of those attending the Convention.

pansions and plans are under way for the formation of a stock company in which Mr. Carlind and Mr. Linton, the Ontario sales agent, would be prominent factors. The health of the Master Plumbers' Association, the house of Jean Paquette, Mr. Odessa Paquette, Tom Carlind, President Johnson, the trade press, etc., were toasted in good old French wine and the "midnight session" was voted a success by everyone accepting the hospitality of the enterprising young supply house so favorably known amongst the trade in Quebec Province.

Banquet at Bout de l'Ile.

On Thursday afternoon a round of pleasure was commenced by the delegates and their friends, assembling at the convention hall and visiting in a body the contractors' exhibitions of building supplies, heating apparatus, etc., in the Victoria Rink. An interesting programme was gone through with here, and the various exhibits of interest to the plumbers and steamfitters were visited and inspected. Views and descriptions of these exhibits are given on other pages in this issue.

After leaving the exhibition the crowd were photographed and taken by street car to Bout de l'Ile, twenty miles down the river, where tables were spread and full justice done to the work of the French chef who concocted the following menu:

Soup

Consomme Royal

Relishes

Olives Concombres Tomatoes Radis
Canape d'Anchois a la Russe

Fish

Filet de Saumon Bouilli du Saguenay,
Sce Tartare

Entrees

Timbale de Ris de Veau a la Richelieu
Filet Mignon Pique Chantilly
Pommes Pont-Neuf

Roasts

Young Turkey Farci, Demi Glace
Aloyaux de Boeuf au Jus

Vegetables

Pommes de Terre Nouvelles Bouillies
Petits Pois Francais
Salade de Laitue a la Parisienne

Desserts

Charlotte Russe a l'Imperial
Creme Glacee a la Vanille
Assorted Cakes
Cheese.
Fromage de Gruyere
Cafe Francais

The balance of the evening was spent in dancing, boating and other amusements, the return to the city being made about midnight.

Drive Up the Mountain.

On Friday afternoon a string of carriages a quarter of a mile long took a jolly party up the mountain drive to the look out point, where refreshments were served and an enjoyable hour spent in viewing the beautiful landscape seen to such advantage from Mount Royal. The return drive was made by another route, thus giving all an opportunity of doing full justice to Montreal's chief point of interest.

This concluded the official list of outings provided by the supply men, but only a part has been told, as from the time the visitors arrived in Montreal until the last delegates took their departure the supply house representatives on the reception and entertainment committees, composed of R. J. Lockhart, R. I. McLaren, J. J. Corcoran, S. R. Brewer, F. Rawley, F. Outram and L. Cohen, backed up by the entire supply house fraternity, did their utmost to make the visit to Montreal a holiday long to be remembered.

STRAY REMEMBRANCES.

George Young, of the James Ballantyne Co., Winnipeg, was seen in Montreal during the convention, but he did not show up to register.

The oldest master plumber to register at the convention was John Date, Montreal, 84 years of age, and 63 years in the plumbing business. The youngest was L. J. Conroy, of Conroy Bros., 193 Center street, Montreal. Mr. Conroy is only 22 years of age, but was one of Montreal's alternate delegates. Another honored delegate was James W. Hughes, for half a century a journeyman, foreman and master plumber in Montreal, and for many years recognized as one of the best sanitarians in Canada, as well as being the inspiration of the Montreal Association in its work of elevating the standard of work done by the trade.

Do-ray-me-fa-so-la-si-do,
Joe Laurier was in Ottawa just a year ago,
Ask him to tell you how he lost his dough,
Do-ray-me-fa-so-la-si-do.

W. H. Meredith for the first time in a dozen years attended the convention as a supply man. When speaking for this delegation before the association, he wanted to tell a few things, but he thought it wiser to forget. As a supply man, "W. H." has made as great a success as he made as an association secretary—and that's saying a lot, as if his ideas had been carried out history would have been written in a different color of ink.

Secretary Walsh, of the Montreal Association, is a young man who will make his mark in the trade as well as in association work.

Secretary Knox's election was a tribute to merit. Few there are who hew to the line and speak more frankly—even bluntly—than Harry Knox. The

W. H. MEREDITH,
Former Association Official, who Attended the Convention as a Supply Man.

sting of his criticism is softened by the earnestness in which it is given, and by the fact that the points are usually well taken. The delegates are to be congratulated on their choice.

"Julia" Vance, of Pittsburg, representing the Wm. Powell Co., Cincinnati, made a good team mate for J. J. Corcoran, of the James Robertson Co., in

entertaining the delegates. And "Jack" did his best to keep "Julia" busy.

Harry Mahoney says he's still waiting for some one to make a remark.

The Plumber and Steamfitter editor has to thank Maison Jean Paquette for one of their souvenir fountain pens. Master plumbers and steamfitters desiring one of these remembrances should accompany their request with a business card, mentioning this paper.

Tom Carlind certainly made good and the House of Jean Paquette deserves to

ODESSA PAQUETTE.

Whose Open-handed Hospitality made the "House of Jean Paquette" the talk of the Convention.

be remembered long for their open-handed and typical French generosity. They ought to see returns in their business.

"Joe" Laurier, otherwise known as "Sir Wilfrid," wears a smile in the group photo. He was sitting next to one of the popular Ottawa young ladies and thinking of his visit to the Capital city a year ago.

Joe Morris Montreal manager of the Dominion Radiator Co., didn't have many Western Ontario delegates to look after, but he did it well. His able assistant, F. Rawley, seemed to be everywhere when a committeeman was wanted.

Where's Westmount? Some couldn't find it from the lookout at the top of the mountain, but John Watson is emphatic that it is on the map.

Harry Moulden may not be a plumber or fitter, but everyone who met him at Montreal will vote to make him an honorary member of the fraternity. He was a "Sovereign" representative of the makers of "Sovereign" boilers and radiators.

Harry Knox lost his hat, but it was before he was elected National Secretary, so it cannot be blamed to that.

One of Ottawa's delegation of the fair sex hid behind an Easter bonnet in the group photo, but she was on deck whenever dancing was indulged in or the dinner bell rang.

R. J. McCauley, of the W. J. McGuire Co., Montreal, ought to make good in the work of organization. If he hasn't a good report to make next year it won't be his fault.

ENGLISH SANITARY APPLIANCES.

The Plumber and Steamfitter has received from Doulton & Co. a copy of their catalogue of sanitary appliances. This firm have a palatial office and showroom on the Albert Embankment, London, England, whereat Canadian visitors are always welcome. Failing a trip across the water, plumbers and sanitary engineers will do well to have a copy of Doulton's catalogue on hand.

Its 430 pages are profusely illustrated with blocks printed on excellent coated paper, and the whole is bound in stiff cloth covers. It is very carefully indexed, and gives details of fittings for asylums, children's homes, factories, hospitals, prisons, public conveniences, schools, mansions, private residences, etc. A full page is devoted to the enumeration of gold medals—250— and diplomas awarded the Doulton products.

CARELESS CHARGING FOR WORK.

One of the most frequent causes of complaint in the metal working business is the lack of system in keeping track of the cost of job work and making charges for it, writes H. A. Just, in the Metal Worker. Most shops have a system which depends entirely on the completeness with which the workman fills out the card, and in actual practice this will, by close observation, be found deficient.

If the workman's time is made up from these time cards he will usually get all his time charged up, but very often he fails to charge it correctly, as he neglects filling out the time card until the day's work is finished, or sometimes until several days have elapsed, and then he is unable to remember exactly the time that he put in on job work which is charged to customers.

He has charged A with 4 hours' repairing his roof and B with 4 hours erecting leader, when the charge should have been A 5 hours and B 3 hours. A pays his bill, paying for the material used and for 4 hours' time, when there was actually 5 hours put in on the job, then B disputes his bill and will pay for only 3 hours' time, as he kept track of the time and knows how much was put in. The result in this case is that the employer has lost 1 hour of the workman's time unless he charges it up to him, and B has gained the impression that the employer was trying to cheat him out of the price of 1 hour's time.

Importance of Small Items.

Another drawback, and one which is a rule rather than the exception, is the failure of the mechanic to charge all the material, etc., sent to the job. He charges 10 sheets of tin and (through a miscount) took out 12; charges two bars of solder when he had in addition a half bar in his tool box; fails entirely to make any charge for acid, nails, charcoal or other small but needful accessories, and all of which must be paid for. He is 15, 20 or 30 minutes in the shop getting his tools, etc., ready to go on the job, but fails to charge it against the job, and he forgets to make a note on his time slip that the wagon had to make a trip to the job to take the ladder and materials and another to bring them back to the shop.

All these are small items, but in the course of a year the aggregate will probably more than pay the rent of the shop. If charcoal is used in the firepots a shop employing 6 to 10 men will use from 600 to 1,200 bushels a year, and at 15 cents this aggregates $90 to $180 a year, and this item must be charged on many bills in the course of the year if a loss is not to result.

Value of a Daily Time Card.

The best way is to check up these charges incessantly and let the men know that everything taken to the job was charged to the shop and must be charged to the job when it is taken out. By keeping everlastingly at it the men will finally learn to be careful, but it cannot be done in a month or a year, and after they are well broken in they must be watched and held up to the standard established or they will get careless. This carelessness and lack of system is the cause of a very serious and demoralizing drain on the resources of the employer, and its effect is so insidious that he often thinks, until the end of the year, that he has been making money when he has actually stood still or gone backward

A daily time card should be provided, and probably the best plan is to have a separate card made out for each job worked on, and it should be made an

LAST YEAR'S EXECUTIVE COMMITTEE.

Secretary Gordon, President Johnson, Past President Hammond and Treasurer Mahoney.

invariable rule, without any exceptions whatever, that the card for a job should be made out before any other job is started, and the employer should see that this rule is enforced by inquiring frequently in regard to the cards and looking them over during working hours to see that the men have made them out. A place should be provided on the card to note cartage, materials taken out, charcoal, acid and miscellaneous items of expense.

Displays of Plumbing and Heating

The first exhibition of builders' and contractors' supplies ever held in Canada, was held at Victoria Rink, Montreal, on August 20, 21, and 22 in connection with the architects and master plumbers' conventions and under the auspices of the builders' exchange. The exhibition was a very interesting one, comprising every imaginable material used in building, with an equally imposing display of interior equipments for the finished structure, from plumbers' supplies to wall paper. The rink throughout was tastefully decorated with flags and bunting, and in the evenings was brilliantly illuminated with electric lights and gas lamps. Altogether there was one hundred and ten booths and sixty-five exhibitors, some exhibiting in two or more booths.

Exhibit of "Viking" and "Daisy" Boilers made by Warden King, Ltd., Montreal.

These ever popular lines made by the Warden King Company always had interested buyers inquiring about and studying the latest additions to their old established line of heating apparatus.

The exhibition was both interesting and useful, not merely to those directly connected with the building trade, but to the general public, as the variety and novelty of the articles on exhibition furnished interesting proof of the great progress being made in the science of architecture. Amongst the various lines of material displayed were plumbers' supplies, builders' supplies, wall paper, stained glass, cut stone and imitations of cut stone, mosaic and other patent floorings, electrical supplies, heating appliances, concrete mixers, derricks, metallic work, paints and varnishes.

The Canadian Fairbanks Company had a good exhibit but they did not include their steamfitters' supplies in the display, which consisted of concrete mixers, scales, lifting machinery and similar builders' lines.

Daisy and Viking Boilers.

To the left of the main entrance Warden King, Limited, had an attractive corner display, as will be seen by the accompanying illustration. The place of honor was given to their efficient "Viking" boiler, it being fitted up for inspection by visiting architects, builders and steamfitters, few of whom are not thoroughly familiar with the good qualities of "Viking" and "Daisy" boilers and with the old established Warden King business. Soil pipe and fittings, bath heaters and stable fittings were also shown to good advantage in the display. Before another season the company will have many new lines to display, including the output of the new King Radiator Company's plant at Toronto. Cluff Bros., Toronto, are also sales agents for Warden King, Limited, in Ontario, the Warden King Company having another sales agency in Winnipeg under the management of Mr. Jennings.

Down the avenue to the right, on entering, was located a most complete exhibit of plumbers' and steamfitters' supplies, made by Maison Jean Paquette, who take the entire output of the Star Iron Works, Montreal, and the Sanitary Plumbing Company, Granby, Que.

As the illustration shows, a display of soil pipe fittings was made along the front of the booth, a section of the boiler being also shown. One half of the exhibit was devoted to the "New Star," several sizes being shown in addition to the miniature models fitted to the pipe railing. These baby models are supplied to customers and can be used to advantage in making shop displays.

Notwithstanding all the improvements which had been made in hot water heating, there was still the objection, that the radiators on the lower floors, and especially in the basement, did not heat as well as those on the upper floors. The water, when heated in the furnace, was apt to rise to the upper stories in preference to the lower ones, and it was only when circulation was well established in the upper coils that coils on the lower floors commenced to heat, and, even then, the heat developed very slowly and necessitated a large consumption of fuel. Having studied the most improved systems of heating, the makers of the "New Star" succeeded in building a furnace with a "Syphon Injector," by the aid of which the circulation in the coils of the lower stories is increased by the speed of the circulation in the coils of the upper stories. This important invention works admirably and gives great satisfaction.

While the special ring shape of the "New Star" hot water sections insures perfect safety against accidents, it has also the merit of showing an unusual area of heating surface, and it is due to this fact that the "New Star" heater has gained the reputation of being the most economical heater known, by 10 to 15 per cent. in combustion. The sections A and B are made in a series of hollow concentric rings connected at a single point at the back of the furnace. These rings being independent of each other, will expand more or less and stand the various changes in temperature without any danger of breaking. There are two different patterns of section, one having rings of a different diameter to the other, and when set in place above the fire-pot the rings of the first section matches the spaces of the next one, and so on.

The plumbing supplies on exhibit attracted particular attention, owing to the fact that many English made porcelain lavatories, closets and stiz baths were shown in addition to the usual enamelware fixtures. The company intends making a specialty of this line, and in view of the present condition of the procelainware market in Canada a good demand should develop.

Maison Jean Paquette are an old established concern which, since reaching out after the trade of English-speaking master plumbers and fitters, has shown considerable enterprise. Their sales representatives are: August Comte, J. J. Hamel and T. J. Carlind, Montreal; W. Linton (Ontario sales agent) and Joseph Bell, Toronto; and L. E. Labrecque and J. A. Plante, Quebec.

Display of the "New Star" Boilers, Heating and Plumbing Supplies made by Maison Jean Paquette, Montreal.
The "New Star" and the English-made porcelain ware were features which attracted a great deal of attention from visitors to the Exhibition.

The Gurney-Massey Company, Toronto and Montreal, exhibited a very fine assortment of hot water and steam boilers and their centrally located display was a popular rendezvous for the trade. The accompanying cut shows a neatly-arranged display of the various kinds of boilers and radiators manufactured by this firm.

Their Bright Idea hot water and steam boiler, one size of which has a range of capacities from 1,000 to 7,000 square feet, occupied a prominent place at the extreme left of the exhibit and won much praise from those who examined it. The castings of the Bright Idea exposed to the direct action of the fire are all small, and having no cross arms connecting the vertical sides with the horizontal top, are not held rigidly at any point; thus, fire being applied, every casting is free to take the lines given to it by the fire, and it follows that there is absolute freedom from expansion and shrinkage, cracks and breakage. It will be noted that every horizontal surface below the crown line is attached to the inside walls by a tapering screw, and is not held in any way at its opposite end, so that it also may go to any angle that may follow any extent of firing. The only connection made in this boiler is one made in the machine shop, and depends on iron-to-iron joints and in no degree on gaskets or any other reinforcing material.

In the matter of space, the Bright Idea is an economizer; it occupied one square foot per horse power, which is less than one-half that required for a tubular boiler of the horizontal type, and it occupies less floor space than any boiler we have ever seen. Internally-fired boilers, where there is no loss of heat through brick work, are the most efficient boilers. No brick covering is required in the Bright Idea, and this, aside from the mere question of room, appearance, cleanliness, etc., is important, because no part of the apparatus is concealed, and the most cursory examination at once develops the fact that it is no more complex than an ordinary stove, which, of course, is the simplest heating structure known. The Bright Idea may be taken into or out of a building through an ordinary door, as the individual parts are all small, whereas a tubular boiler requires the removal of a large section of the floor or wall of the building, sometimes both.

The Bright Idea tube is almost self-cleaning, and cleanliness is one of the leading qualities of this boiler. In the case of a tubular boiler, or of a cast iron boiler put together with a smooth nipple, an accident occurring, causing a leak, the boiler must be repaired before it can be used, while a Bright Idea may be continued in use by blanking off the leaking section, leaving the repair to be executed at pleasure during the following summer.

A sample of the company's Oxford steam boiler, which ranges in capacity from 250 to 1,200 square feet, can be easily recognized at the right of the accompanying engraving, while toward the centre will be noticed several sizes of Oxford hot water boilers, which are put together with push steel nipples, and when once set up remain tight and eliminate all leakage.

The assortment of steam and hot water radiators shown by this firm was also very complete, including a range of push nipple joint radiators covering every possible requirement of either the hot water or steam fitter.

The goods this firm exhibited at the Contractors' Show represent only a small portion of the lines manufactured by them, as they also manufacture a complete line of stoves and ranges for every requirement, including large steel hotel ranges and bake ovens.

Artistic Exhibit of "Gurney" Heating Goods made by the Gurney-Massey Co., Montreal.

This display, located directly in front of the stage, was a popular meeting place and the "Bright Idea" hot water and steam boiler won much praise from those who examined it.

One of the first exhibits attracting attention on passing through the main entrance was the magnificent display of the Dominion Radiator Co., in the centre of which and arranged from the lowest in front to the highest at the back, are shown forty designs of the famous "Safford Radiators," including the Favorite, Zenda, Acme, Perfect, Ideal, Daisy, Florence, Princess, Maple Leaf, Trident, Victoria, Ontario and dining room patterns, in all heights, curves, angles and circles. The background was prettily draped in green and white and bearing banners and signs setting forth the address of the various branch houses in all parts of the world. In front and in the centre at the top, a shield with flags and the Dominion coat of arms, underneath which was placed a small Maple Leaf radiator, designating the firm's name. Across the entire width of the space a large sign bearing the words "Largest Radiator Works in the World," a claim which their monster new plant makes it possible for them to make. On the right hand corner, and very becomingly mounted, is their "Triumph" steam boiler, and on the opposite side, the "Safford" hot water heater.

The Safford boiler has stood the test of practical experience for so long that it is unnecessary to enumerate its many claims. A few words, however, will not be out of place in reference to a few of the chief points and the wide range made, the fourteen sizes ranging in capacity from 500 to 2,645 square feet of surface.

The fire-pot is made solid with a cast iron crown or top, having four flues for the passage of the products of combustion. The water ascending the sides of the pot is circulated directly over the most intense heat and then passes to the rear extension which forms the base of the rear water post or column, from which the water passes into the rear extension of the next section immediately over the combined pot and crown. The fire-pot is corrugated all the way around the interior, the corrugations standing the coal away from the pot sides, so that the upward draft at these points gives the ignited coals an effective combustion and increases the heat transmitting capacity of the inner wall of the fire-pot.

The number of connecting joints has been reduced to a minimum, the four section heaters (with pot, two intermediate sections and dome section) having only three joints, and the heaters with three intermediate sections having four joints. The old time method of making up the joints with rubber gaskets has been discarded, and a cast iron machine-turned nipple-joint substituted.

A feature of the exhibit not yet mentioned is the "Honeywell heat generator," connected to the water pressure behind the radiator fence on the right side of the engraving. The generator acted as a fountain, keeping up a pressure close to ten pounds under difficult conditions, complete circulation being maintained. The "Honeywell," which has been talked about so much in the American trade papers this summer, is to be sold in Canada by the Dominion Radiator Company, and their exhibit of this labor-saving hot water, heating device deservedly attracted a lot of attention from the architects and steamfitters who visited the exhibit.

Messrs. B. J. Morris and F. Rawley, Montreal, representatives of the company, were in charge of the exhibit.

The Dominion Radiator Company's Fine Display of Safford Boilers and Radiators.

Situated opposite the main entrance, this exhibit always had a crowd inspecting the heating goods and the "Honeywell" Heat Generator in Operation.

VALVES AND VALVE CONSTRUCTION

Paper read by A. H. Hecker before the Modern Science Club, Brooklyn.

In the first place, owing to the steadily increasing pressure in steam plants, it has become necessary to use a good deal better material in the manufacture of valves than was formerly used and to make them heavier than was necessary under the old days of low pressure. For instance, the Government has adopted the following formula as a standard valve mixture: 87 copper, 7 tin, 4 spelter, 2 lead. The ordinary commercial mixture for valves is 86 copper, 2 tin, 5 spelter, 7 lead. Another cheaper one is 80 copper, 7 lead, 13 spelter. These, of course, are very much cheaper mixtures, figuring $22.20 per hundred for the cheaper one and $24.10 for the better, as against $26.11 for our mixture, which is used in all our high grade valves. There is still, however, I regret to say, a demand for cheap valves, and as long as this demand continues there will be manufacturers to supply it. It is the greatest fallacy in the world to use cheap engineering specialties, because a man who insists, for instance, on buying valves at a cheap price will certainly get cheap valves. Manufacturers are not philanthropists, and they make proportionately more, and very often literally more, on a so-called cheap one-inch valve than they do on a high grade one of the same size, which will give the consumer four or five times the life and ten times less trouble and repair work. Where is the economy in paying seventy-five cents for a valve, putting in, say, two dollars' worth of time repairing it and then removing it from your piping system and throwing it away at the end of six months or a year, when for one dollar and fifty cents or two dollars you can buy a good valve, have absolutely no trouble with it, and have it last practically forever? Along this line I desire to make a few remarks regarding the installation and care of valves.

How Valves Are Abused.

Probably few fittings are more abused than globe or gate valves by the careless or thoughtless workman while putting them in place. Hundreds are ruined by merely screwing them up. They should never be wrenched by the end opposite the joint that is being made, but the wrench should be applied directly to the end to be screwed up; otherwise the shell or walls of the casting are sure to be twisted or strained more or less and the valve seat made untrue, then, when the pressure is turned on, the valve leaks, and the manufacturer gets all the blame. Again, a globe or gate valve should never be gripped in a vise while screwing up the pipe, as, no matter how strong the valve may be, damage is sure to occur. Another source of injury is the practice of sousing the screw ends with red lead or cement before applying the pipe; the consequence is, the cement is shoved forward into the valve, runs on to the seat or disk, and before the fluids can pass through the valve and wash them thoroughly out, the cement hardens and again the manufacturer is blamed because the valve "leaked from the start." No cement should ever be put in the screw of the valve, but always on the male screw of the pipe, and then very sparingly. It is better for brass valves not to use cement at all, as a few drops of oil on the pipe thread will insure a better joint. After a job is completed the valve disk should never be screwed down, but left wide open until all the pipe chips, iron rust, etc., are blown out thoroughly, as many a valve has been ruined by screwing the disk down on a small particle of rust or iron chip, which is driven into the metal of the seat of the valve, causing a leak "from the start," for which the manufacturer is also blamed. In the use of valves they should never be allowed to wear without occasional examination, as with the facilities afforded in the Powell make for re-grinding they can at all times be kept in proper condition.

OUR FRONTISPIECE.

Our frontispiece, published through the courtesy of "Modern Sanitation," is a fine reproduction of the prize painting from the Pittsburg Carnegie Institute.

The canvas pictures a leafy bower by the side of a sylvan stream. In the foreground the artist has painted the nude form of a woman in the act of robing after her bath in the stream. This figure is the central one in the picture, and the perfect modeling and splendid art evident in the execution of it is the most praiseworthy feature of the entire subject. There is a great transparency and fidelity to nature in the flesh tint of the figure, which seems to glow with health and be almost imbued with life. The foliage which forms a natural canopy over the nude figure of the bather, is alive with beautiful color and is alone well calculated to win distinction for the picture as an example of truthful painting. A perspective of deep voilet and purple forms a solid background for the brighter tones of green and yellow which dominate the foreground, and there is brilliant harmony as well as daring originality in the color treatment of the whole subject.

TOM CARLIND,

Ontario Sales Representative of the "House of Jean Paquette."

The motive of the painting has been but lightly touched upon by all reviewers, and indeed the meaning the artist intended to convey is difficult to understand. In painting the central figure he no doubt intended to idealize in the form of a woman all that is perfect, pure and beautiful. In that he has succeeded. The repulsive figure of the satyr who is seen crouching behind the palanquin can only be intended to typify the baser elements in man's nature. The introduction of this figure is the one jarring note in the picture. The countenance, which is partly masked by a garland of rose leaves, expresses only degeneracy and evil, and clearly conveys the mental attitude of this mythical man-beast who cowers before the purity and beauty of the figure before him. The Cupid in the picture softens to some extent the coarseness of the satyr's presence, and symbolizes the protection of love surrounding the bather's virginal purity and beauty.

Gaston La Touche, the artist who captured first honors at this year's exhibition, was born in St. Cloud, France, and for a number of years has ranked as one of the foremost artists of the world.

WHAT DISTRESSED HIM.

An elderly bishop, a bachelor, who was very fastidious about his toilet, was especially fond of his bath, and requested particular care of his tub from the maid.

When about to leave town one day he gave strict orders to the housemaid about his "bawth-tub" and said that no one was to be allowed the use of it.

Alas! the temptation grew on the girl and she took a plunge.

The bishop returned unexpectedly, and finding traces of the recent stolen bath, questioned the maid so closely that she had to confess she was the culprit, and was very sorry.

"I hope you do not think it is a sin, bishop?" asked Mary in tears.

Eyeing her sternly, he said: "Mary, your using my tub is not a sin, but what distresses me most is that you would do anything behind my back that you would not do before my face."

ELECTRIC SIGNALS.

An electric signal has been invented by M. A. Ewing and J. H. Ewing, Gallatin, Texas. The improvement pertains more particularly to an electric apparatus suitable for block signals, and in all relations where the movement of rolling stock or the like is controlled by, or exerts control over, appropriate alarm mechinasm. Also, to means for producing an alarm upon a movable member of rolling stock, such as a locomotive, and independently of this alarm for producing another alarm at a station or other predetermined point.

FIRING HOT WATER BOILERS

Written for The Plumber and Steamfitter by M. J. Quinn, Toronto.

In common with hundreds of other mechanical devices, a hot water heating system often fails to give the maximum of satisfaction because of a lack of knowledge respecting its operation on the part of the owner, and in that way it often happens that a steamfitter obtains an undeserved bad reputation because he has either not realized or has overlooyed the necessity of properly instructing his customer how to operate a heating system after the same has been properly installed, and in order to correct some false impressions existing in the minds of many people respecting the care and method of dealing with their heating appliances, it may be well to explain what has been found in practice to be the best rule to be followed in the care of a hot water boiler.

First, it must be assumed, of course, that the boiler is connected to a suitable flue, i.e., one that is of suitable diameter and height, reasonably smooth and with tight mortar joints, so that there will be no suction of air from any point except through the smoke pipe, and that the boiler sections will be thoroughly swept out once a week, or oftener, according to the character of the fuel and the amount of ashes and soot deposited on the sections, for it must be borne in mind that a layer of ashes, say half an inch thick, on the top of each section will reduce the capacity of the boiler perhaps 30 per cent. by insulating the iron from the passing heat.

The complaint most often heard is that the house is cold in the morning, and that a fair temperature cannot be obtained until about the middle of the day, and this in most cases is due to faulty firing on the part of the owner, because, if a fair temperature may be obtained during any part of the 24 hours, it follows that the system has ample capacity, and that, if a little care is taken, an equally high temperature may be obtained at any other time during the day.

Now, what is the cause of a drop in temperature in the morning? It is due to a combination of two circumstances, viz., first, to the well known fact that the lowest temperature during the 24 hours is about four o'clock a.m., and, secondly, and vastly more important, to the fact that the owner usually adopts a wrong course in preparing a fire for the night just before he goes to bed; for instance, it is a common practice to shake the grates, put in a considerable amount of fresh coal and turn on the drafts for twenty or thirty minutes "to burn the gas off," and herein lies the great mistake, because the fire gets such a good start in this way and there is so much fresh fuel that the hottest fire during the 24 hours is likely to be about two o'clock in the morning, and from that time it gradually dies down so that at the end of the next six or seven hours, or about eight o'clock in the morning, the fire is almost entirely burnt out and the house is cold.

To overcome the resulting difficulty it has been found good practice, first, to shake the fire very little in the morning and put on some fresh coal, to which may be added two or three times during the day enough coal to keep the temperature sufficiently high, so that about ten or eleven o'clock at night there will be three or four inches of good clean fire on the surface and several inches of ashes on the grate.

If the grate then is given a good vigorous shaking and all of the ashes cleaned out, there will be enough room to place in the fire pot a considerable body of fresh coal. The furnace doors then should be entirely closed up, and the key damper in the smoke pipe placed in such a position as experience with each individual chimney will dictate would produce the best results. The

W. C. HEINRICHS, MINNEAPOLIS, MINN.
Representing the H. Mueller Manufacturing Company, Decauter, Ill., in Western Canada.

damper in the fire dor should be left open in order that sufficient oxygen may be drawn in to mingle with the gas given off by the coal and produce combustion, otherwise, all of the gases will pass up through the chimney without burning, and will be a total loss.

It will be found that the fire will begin to burn up slightly about one o'clock in the morning and will gradually increase in intensity until, say, five or six o'clock, when there will be found to be a good hot bed of coal in the boiler and a very comfortable temperature throughout the house.

The necessity for a vigorous shaking of the fire in the morning is obviated, and the ashes are permitted to accumulate, so that the operation of the night before may be repeated.

Firing the boiler in this way will be found to give the very best of satisfaction, and, if the radiators are not kept hot when there is a good fire on, the plumber might pay special attention to the quality of the coal, which is entirely responsible in many cases where he, and the boiler that he installed, has received unmerited blame.

BOILER DRAFT.

No greater waste occurs in modern steam-boiler practice than that which is inherent in the employment of a chimney for the production of draft, namely, the loss of heat in the escaping gases. As the chimney depends for its action upon the maintenance of a temperature difference between the internal gases and the external air, it is manifest that, with a chimney, this waste can never be eliminated. It may be palliated, it is true, by the building of higher chimneys, so that the same intensity of draft may be provided with a lower stack temperature. But such means of providing for the utilization of the otherwise waste heat is expensive. For instance, if with an external temperature of 60 deg. and an internal temperature of 500 deg. sufficient intensity of draft is produced by a chimney 100 feet high, it will require a height of 175 feet to produce the same draft when the temperature of the gases is reduced to 250 deg. In addition, the means provided for extracting this heat will increase the resistance, and provision for overcoming the same will have to be made by greater chimney height.

In the case of a fan, however, the power expended, measured in heat units, necessary to produce the same result may, under ordinary conditions, be only about one-seventy-fifth of that necessary with a chimney. In other words, the fan renders available for utilization practically all of the heat wasted by the chimney, while it possesses the further advantage of readily creating the additnonal draft required when heat-abstracting devices are introduced.

Messrs. Donkin and Kennedy, in 17 independent boiler tests, found the heat lost up the stack when no economizer is used, to range between 9.4 per cent. and 31.8 per cent. of the total heat of combustion. As it is not practicable to cool the gases to atmospheric temperature, it is evidently impossible to utilize all the heat, but the ordinary economizer should, with mechanical draft, show a saving of between 10 and 20 per cent.

WATER-BACK SHIELD.

Heat radiated by a hot water boiler connected with a water back attached to a range frequently renders a kitchen uncomfortable, especially in summer, and in many cases the backs are removed at such time, and it is often necessary to open the hot water faucet so as to cool the boiler.

A device recently invented by S. M. Stevens, Asheville, N.C., dispenses with such inconvenience and also avoids heating water when not wanted, thereby economizing in fuel.

HOW MASTER PLUMBERS SHOULD ADVERTISE

Some practical suggestions made by a writer in Printer's Ink.

My! what an advertising proposition the retail plumber has, if he ever gets around to take it up in newspaper talks.

So far he hasn't got around to any appreciable extent. Sometimes he invests in a little newspaper space, and puts in a catalogue cut of a closet, a diagram cut, a skelton cross-section, full of the draughtman's arrows and key-letters, which means nothing whatever to the average reader. And when the plumber adds a few words to this technical exhibit, his language is a good deal like a cross-section, too. He confesses that he is a sanitary plumber, and says something about repairs, and gives his telephone number.

When he really gets around to seriously talking about his craft, however, the plumber will probably have more good arguments than any other man appealing to the public on retail lines. It takes big books to tell the whole story of modern plumbing and sanitation, and conditions differ in each locality.

Practical Talk Needed.

The first thing he ought to swat, good and hard, once for all, is the ancient plumber joke about prices. He resents it every time he sees it in the newspaper funny column. If he advertised more, perhaps the newspaper editor would form a combination to kill that joke whenever it appeared. But even if he didn't, the plumber could easily kill it as far as his own business is concerned by demonstrations that good plumbing is worth all the public pays for it. He could talk about the difference between little flimsy lead pipe, for instance, and the thick kind that can hardly be broken even by freezing, that simply lets out a notch or two under inward pressure. That kind costs more per foot, but it saves many times its cost, usually, in a cold snap, by preventing ruin of plaster work, wall coverings, carpets. Then there are the different kinds of bath tubs and water fixtures, and gas chandeliers, and what not. Some of them are so flimsy as to be not worth putting up, while others, the quality kind, outlast a house. When the public knows what value is in plumbing, and how a little extra expenditure for good workmanship during installation is going to save big repair bills in the future, it will forget the plumber joke and be willing to pay a reasonable charge for the work of a real plumber.

Public Needs Knowledge.

Then think of the wonderful advertising stories there are locked up in the big books on sanitary engineering. Think of the remarkable advances that have been made in this field the past fifteen years by scientists, engineers, manufacturers and working plumbers. And how little the public knows about it all. And how simple the whole thing is fundamentally. There may be complexities, to be sure, when it comes to working out a modern sanitation plant in detail, but the reasons, the why and wherefore, are as simple as A B C, and every one of them means comfort and health, and protection to the family for whom it is installed.

How many property owners know the different schemes there are nowadays to get a supply of hot water?

How many know the different methods of drainage and sewage disposal?

How many know the different stunts to get a pure, constant water supply in the suburbs or country away from city mains?

How many know the comparative merits and uses of different systems of heating, or when a house has been properly safeguarded with vent pipes, or what a trap does, and the different kinds, or what varieties of closet there are, and the service they perform? Who knows very much about filtration devices, or water-softening plants, or laundry conveniences?

These things can all be taken up in simple newspaper talks, and explained from the standpoint of cost and service rendered by each kind of device. They can be taken up in connection with local plumbing problems, such as doubtful character of the city water supply, or kind of soil that is encountered where cesspools must be installed, or the sort of pipe needed to ensure drinking and cooking water free from harmful metal ingredients, or the price of coal, the price of electric current, and what not. Every plumber of experience has information buried in his bosom concerning local conditions that is not only interesting, but which actually means life and health to every person who lives in his community. He ought to take the public into his confidence. He ought to show householders what true economy and comfort and security are in plumbing. He ought to talk to landlords on the commercial possibilities of attractive and safe sanitary fixtures in flats, apartments, office buildings, hotels, theatres and similar buildings. It is the easiest thing in the world to demonstrate that a wise investment in such fixtures pays a good return in increased rent. The real estate agent is awake to this, if the plumber isn't, for he long ago learned that the kitchen and bathroom sell the house, and that it pays to save money on other rooms for the sake of showy tile and fixtures.

Urge Prompt Repairs.

The advertising plumber, too, will talk to good purpose about his repair service. Modern Sanitation, the bright little organ of the Standard Sanitary Mfg. Co., Pittsburg, relates an instance of a plumber who was called up on Sunday at his house and asked to help a householder out of trouble with a burst water pipe. The plumber responded in kid gloves, shutting off the water until repairs could be made on Monday. This slight service led to a large installation contract. But the modern plumber ought to go further than that in his repair service, particularly in winter months. He ought to have a day and night service if possible, and be as ready and accessible as the doctor—he is just as badly needed in emergencies. And he ought to tell the public about this emergency service. It could be made one of the biggest feeders for his installation business.

The advertising plumber, too, will talk of antiquated fixtures. Heaven only knows how many of them there are in his town, and few realize what a large proportion could be ripped out to-morrow by proper advertising. A little scare advertising is needed here, something in the shape of talks that will show people they are practically living over a cesspool as long as they cling to antiquated plumbing. The right kind of newspaper talk, backed up with some special offer, would bring dozens of these folk to the surface, and afford them good, live prospects to work upon with mail literature and personal solicitation.

He may talk about still another feature of his business for which he pays a heavy tax in money, time and study, namely, the legal restrictions under which he works, and the examinations he and his employes have to submit to. These are a safeguard to the public and an insurance against scamped work. But the public really knows little about them, and should be told.

Behind in Advertising Methods.

The plumber cannot be scolded for his lack of enterprise in the matter of advertising. For he unquestionably spends money on a rather liberal scale already, and, stimulated by some of the manufacturers of supplies, has in the past few years made great advances in selling his services and displaying his goods. But it must be admitted that in comparison with other retailers, his advertising makes no very distinct impression. He has thus far been content to confine his announcements to a plain business card.

What is needed now is more information in his advertising. With all the subjects and devices, the methods and different qualities of fixtures that he has to talk about, advertising for him should be of the most vital interest to his public. His calling is second to no other in promoting the safety and comfort of the public, but at the same time that very public, if it is going to realize the highest good he can perform for it, must be educated along the lines of modern sanitary science. It is his duty to be an educator, and therein lies both the reason for and the method of his advertising.

THE MOTHER OF PROGRESS.

Discontent quickens the blood of inactivity and makes the heart throb with future hopes.

Discontent drove an oxen-team across the prairies and built cities in the west.

Discontent turned the candle light of our forefathers into the electric power of to-day.

Discontent is the spur that pricks the heels of progress—that makes the rivulet a running river.

Discontent abandons the fossils of the valley and climbs the mountain in search for nuggets of gold.

Discontent changed the merchant from selling one line of goods to the modern department store.

Discontent got out of the rut made by his progenitors on to the highway of modern business.

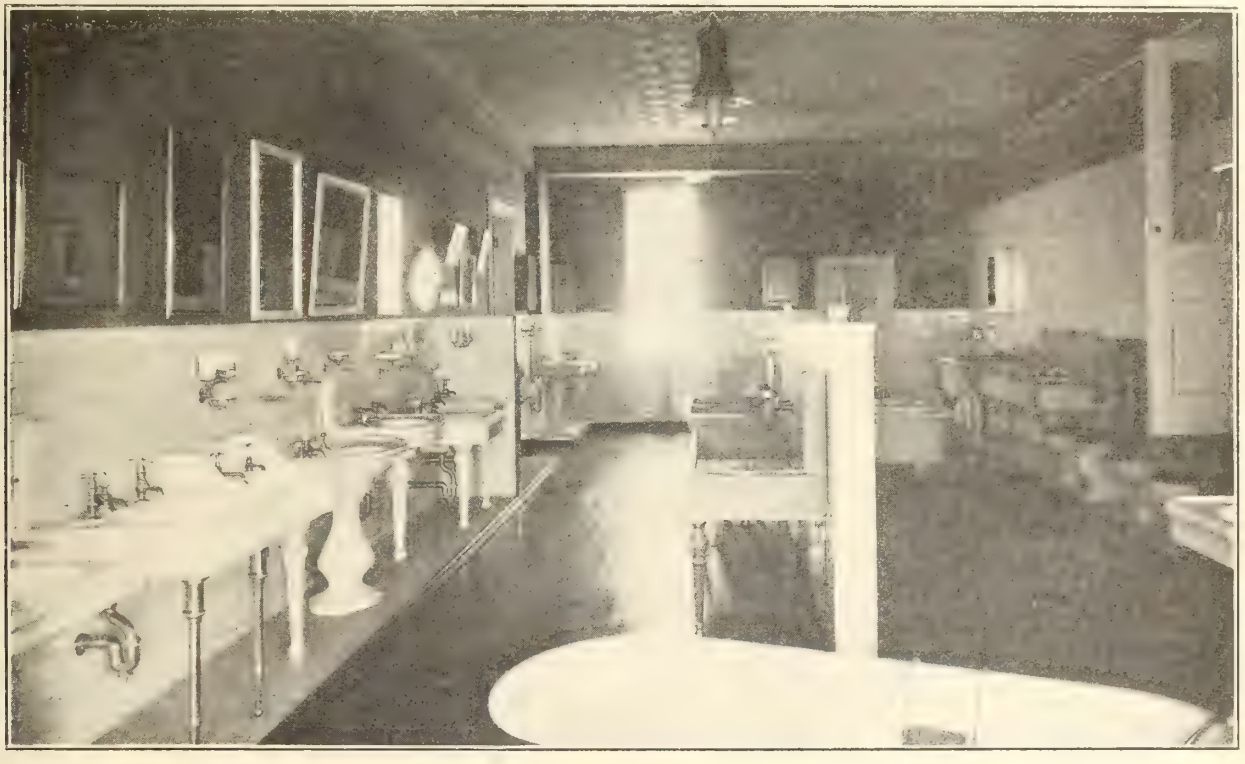
VALUE OF DISPLAY IN THE PLUMBER'S SHOWROOM

By Charles James Fox, Ph.D.

An attractive display room is to-day an absolute essential in every plumber's shop which deals in plumbers' supplies. In bathroom plumbing especially the attractive, almost artistic, appearance of the numerous fixtures and of the tiled floors and walls is one of the things which appeals most strongly to the prospective purchaser. The beautifully tiled bathroom, with its open plumbing fixtures, is to-day regarded virtually as a necessity which no house owner will do without, provided he has the money with which to purchase it. In fact, in the building of the modern home too much economy is often practiced on other parts of the house in order to be lavish in the interior decoration of the bathroom.

The enterprising dealer in plumbers' supplies who is alive to the laws of attractiveness of these fixtures in the bathroom of the home.

The floors and walls of the display cases in the windows should also be covered with decorative tile, because, as every tradesman knows, nothing draws customers more quickly than an attractive looking show window. The plumber perhaps more than any one else should be able to appreciate the cleanly, attractive, durable and sanitary properties of tiling, from the fact that he sees it every day on the floors and walls of bathrooms in every building, either public or private, which is not run up in the cheapest and most temporary manner. The fact that their work is placed side by side has brought about a kind of community of interest between the plumbers and the tile setters. In fact, in many smaller towns where there is



The Interior of a Plumbing Showroom.

competition and trade realizes well that to dispose of his wares to advantage he must display them under the most favorable circumstances. Consequently the interior of his display rooms in which he exhibits his bathroom fixtures should be as neat, attractive and sanitary in appearance as the bathroom is itself to be. In other words, the display room should be tiled throughout with the real clay tile. In such a shop the man who thinks of purchasing plumbing supplies for his bathroom is enabled to see at a glance how these fixtures will look when set in place in his own house. Nothing shows off the plumbing supplies in the display room better than a beautifully tiled floor and wall, just as this same floor and wall covering emphasizes the

no tile setters' union, the plumber is frequently compelled to contract himself for the tiling and to lay it himself with the aid of unskilled labor. The idea of tiling the plumber's showrooms is not a new one, but its adoption is not so general as its merits, from a strictly commercial standpoint, if from no other, seem to justify.

A NEXT CENTURY BATH.

"The bath of the next century," says T. Baron Russell in his book "A Hundred Years Hence," "will lave the body speedily with oxygenated water delivered with a force that will render rubbing unnecessary, and beside it will stand the drying cupboard, lined with some quickly moving arrangement of soft brushes and fed with a highly desiccated air, from which almost in a moment the bather will emerge, dried, and with a skin gently stimulated and perhaps electrified, to clothe himself quickly and pass down the lift to his breakfast, which he will eat to the accompaniment of a summary of the morning's news read out for the benefit of the family or whispered into his ears by a talking machine."

HANDY WRENCH.

An improved wrench has been patented by A. L. Moss, Sandusky, Ohio. As no swinging movement of the handle is required in this improvement, it is evident that the wrench can be used to great advantage for turning bolts, nuts, and the like located in placess not readily accessible to an ordinary wrench. The tool may, however, be used as an ordinary wrench.

CLEANING PORCELAIN BATH TUBS.

To clean a porcelain lined bath tub, use hot water and a rag saturated with gasoline. If the gasoline is objectionable, smear a little vaseline on the dirtiest parts and remove dirt and vaseline at once with rag and hot water. Never scour porcelain tub, nor nick nor scratch its surface in any way.

NEWS OF THE TRADE IN CANADA

Massey, Ont., will spend $10,000 in waterworks.

Sudbury, Ont., will spend $10,000 in waterworks extension.

A new pump house and equipment will be installed at Ottawa East.

The village of Hintonburg, Ont., will raise $10,000 for waterworks.

W. J. Campbell, Ottawa, will erect a boiler works in that city to cost $20,000.

The ratepayers of St. Felicien, Que., will vote on a by-law for a waterworks system.

A by-law has been passed at Welland, Ont., to raise $11,940 for waterworks extension.

An American brass manufacturing concern are anxious to obtain a site in Sarnia, Ont.

Brickman & Orman, plumbers, Stratford, Ont., have been succeeded by Brickman & Stoll.

W. J. McClung, plumber, Port Hope, Ont., recently had his premises and stock damaged by fire.

F. Cochrane & Co., Sudbury, have the plumbing and heating contracts for the new hospital at Sudbury.

A by-law will be submitted to the ratepayers of Hamilton, Ont., to raise $50,000 for waterworks pumps.

Ingersoll, Ont., will purchase the waterworks for $95,000, subject to the passing of the necessary by-law.

A Worthington steam pump has been installed at the Point St. Charles station of the Montreal waterworks.

The Portage la Prairie council will ask for a grant of $50,000 for the completion of the waterworks system.

A plant capable of delivering 40,000,000 gallons per day will be installed by the Rainier Development Co., at New Westminster.

Moore & Brown, Sault Ste. Marie, have been awarded the contracts for the plumbing and heating work on the large hospital to be built at the Soo.

T. P. Calkin & Co. have established a plumbing, heating and sheet metal business at Kentsville, N.S., under the management of Lewis G. Ellis.

Robert Ross, Toronto, ex-president of the National Association, left recently for Scotland where he will spend a year in an endeavor to recover his health.

The firm name of the Peterboro Boiler & Radiator Co. has been changed to that of the Canadian Boiler & Radiator Co., with headquarters at Hastings, Ont.

The buildings of the new plant of Jenkins Bros., Montreal, have been completed and the machinery is being installed. They will make valves of all kinds.

Tenders are being called for the alterations, additions and repairs to the Tete du Pont Barracks, Kingston, Ont., by the Department of Public Works, Ottawa. Tenders will be received until the 9th of September.

The recent annual picnic of the London brass finishers at Port Stanley, was a huge success. About 500 employes of Labatt's, the Empire, London Brass and the Mann Company works, took in the trip and enjoyed themselves immensely.

A five hundred light acetylene gas plant has been purchased by H. W. Brown, hardware merchant, Plattsville, which will be used to illuminate the majority of the business places and many of the private houses in that town.

O. Picard & Sons, plumbers, Quebec, have been awarded important contracts for installing heating by hot water at the English Cathedral, as well as the plumbing, heating and electric wiring at the new building of The Daily Telegraph.

At a special meeting of the Chatham, Ont., water commissioners last week the proposition of the Chatham Gas Co. to supply the waterworks plant with natural gas for a period of five years at 12 cents net per thousaad cubic feet was accepted.

Contracts for the Flanagan Hotel, Saskatoon, Sask., now in course of erection, have been awarded as follows: general contract, Shannon Bros.; plumbing, G. G. Taylor; heating, Splayfords'; metallic roofing, cornices and galvanized iron work, M. Isbester & Son.

THREE POPULAR SALESMEN.
L. L. Anthes, Toronto Foundry Company; G. M. Watt, Dominion Radiator Company; and J. R. Foster, of the James Robertson Company, Toronto.

There is a strong probability that Hamilton, Ont., will issue contracts this year for a complete new electric pumping service in connection with the municipal waterworks. It is proposed to submit a by-law to the people in a short time for the expenditure of $30,000 on new pumps of the modern type. The present steam pumps have been in operation ever since the inauguration of the present system, but owing to the rapid growth of the city, they are becoming entirely inadequate for the city's needs. The new pumps will have a capacity of 10,000,000 gallons a day.

Belleville is soon to have in operation another large industry in the shape of a brass foundry, work on which commenced on Monday of last week. The works will be of brick and stone and will be 136 x 40 feet. The foundry, when completed, will be one of the best equipped of the kind between Toronto and Montreal, the company having plenty of capital behind the undertaking. The output will consist of brass fixtures of all kinds. P. C. Jones, Belleville, is one of the chief promoters of the company and H. C. Hunt is another, the latter resigning the secretaryship of the Belleville Hardware Co. in order to devote all his time to the new organization. He has been succeeded by Charles McMullen.

BATH CABINET.

An invention referring to cabinets for steam or medicated vapor baths and especially useful as an attachment for and in connection with bath tubs of the usual kind, has been successfully worked out by C. W. Groover, Valdosta, Ga. The aim is to provide a cabinet or cover by means of which the ordinary bath tub can be converted into a steam or vapor bath, which is capable of being removed and packed small when not in use, and which the bather can manipulate without assistance.

WATER CLOSET FLUSHER.

An improved flushing device for water closets, bowls and the like has been invented by L. W. Eggleston, Appleton, Wis. The usual tank and supply tank are employed by the inventor. At the upper end of the pipe is a valve casing in which is a nozzle or injector discharging water into the tank. A plug valve having slidable movement within the casing and movably connected with which is an actuating lever, through whose medium the valve is closed to open the nozzle outlet and again close it.

BUILDING NOTES.

A Presbyterian church will be erected at Finch, Ont.

A large school will be erected at Haileybury, Ont.

The new C.P.R. sample room at Vancouver will cost $28,000.

H. Robb, Winnipeg, will erect an apartment block to cost $58,000.

D. Gibb & Son, Vancouver, will erect an apartment house to cost $115,000.

The new Seamen's Institute Building, at St. John, N.B. will cost $15,000.

The new medical building at McGill University, Montreal, will cost $500,000.

The Robert Crean Co., Toronto, will erect a warehouse in that city to cost $10,500.

A. E. Carter, Vancouver, will erect an apartment block in that city to cost $40,000.

The trustees of the University of Toronto will erect a residence in that city at a cost of $150,000.

The corner stone of the new high school at Picton, Ont. was laid recently. The building will cost $50,000.

The congregation of St. Alban's Church, New Westminster, B.C., will shortly erect a large church, the plans having been accepted.

The contract for the building of the new court house at Victoria, B.C., has been awarded to McDonald, Wilson & Snyder of that city. It will cost about $100,000.

PLUMBING AND HEATING MARKETS

TORONTO.

Toronto, August 26. There has been very little activity in local plumbing circles for the past fortnight and the market this week is entirely devoid of interesting features. While fair August trade is being done in seasonable lines, there is not, however, that vitality to the market that jobbers reasonably expect with the close approach of September. The local plumbers' and steamfitters' strike is apparently as far from settlement as ever and no doubt is indirectly responsible for much of the dullness that characterizes the market at the present time.

Iron Pipe—Supplies of pipe are still quite inadequate to meet the demand which continues strong. The mills are doing their best to catch up with the trade, however, and the scarcity is not as marked as it was a couple of weeks ago. Prices are unchanged and remain firm, as follows: ½-in. black pipe, $2.90; ½-in. galvanized, $3.75; 1-in. black, $5.60; 1-in. galvanized, $7.25.

Soil Pipe—Supplies are well up to the needs of the trade, and prices remain unchanged. The strike continues to hold back trade in soil pipe to a considerable degree, but present quotations are still an inducement to cause many dealers to lay in a stock while the prices are low. We quote: Medium and extra heavy pipe and fittings, up to 6-inch, 70 per cent.; 7 and 8-inch pipe, 40 and 5 per cent.; light pipe, 50 per cent.; fittings, 50 and 10 per cent.

Solder and Lead Pipe—Since the recent decline in lead pipe there has been no further change in the price which remains firm at 5 per cent. off list. A fair demand exists for both lead pipe and solder, with wiping solder still quoted at 23c per pound.

Brass Goods—Compression work, etc., is in fair demand with discounts unchanged. Compression work, 57½ and fuller work 65 per cent. The figures for ground work run as follows: Bibbs, 45; roundway, 50; and flatway work, 55 per cent.

Cast Iron Fttings—The demand continues fair with the price firm at 57½ per cent. off list.

Enamelware—Bathroom enamelware is now in greater demand, as many new buildings are now ready to have the fixtures installed. Prices are unchanged and the January price list is still being adhered to.

Metals—The demand for lead shows a slight increase over last week. Local prices are comparatively steady, Imported pig lead being still quoted at $5.35. Copper has had an increased sale locally; casting ingot copper is quoted at 22c, and has attracted quite a number of local buyers at that price during the week. As for the American market, the past week has seen but little change in the copper metal market, although naturally some consumers there have been drawn into the market by the reduction in price and are making small purchases. Meanwhile, the producers are contented; they are harboring their resources for the demand which they know must come sooner or later, and when it does come they want to be prepared to meet every order in the shortest possible time. A few shipments of orders placed months ago have been made during the past few days, but that is about all. In old materials the market continues extremely dull.

MONTREAL.

Montreal, August 26.—Present market conditions are quite satisfactory for this season of the year, and the outlook for the volume of business to be transacted during the coming season is very hopeful. Prices in all lines of plumbing goods with the exception of brass goods, are firm. From present indications there are no reasons for apprehension in the plumbing trade. Business at present is on a sound basis, and unless something extraordinary occurs, trade in the coming year will in all likelihood be a record-breaker.

Iron Pipe—The demand is moderate and steady. The advances made a few weeks ago are well maintained. Prices are unchanged. We continue to quote: 1-in. black, at $5.60, and 1-in. galvanized, at $7.26.

Lead Pipe—Locally, prices are firm: Lead pipe, 7c; lead waste, 8c, net list.

Brass Goods—At present a stronger demand prevails than the manufacturers can, with ease, look after. Orders are arriving in increasing numbers and as supplies of raw material are rather delayed in coming to the factories it might not be beyond the bounds of possibility that stringent conditions develop. Prices are firm and unchanged. We quote: Standard compression work, 57½ per cent. discount; flatway work, 55 per cent. off; fuller work, 70 per cent. off.

Enamelware—Although the Amherst foundry has not yet gotten sufficiently to look after its trade, the Port Hope factories are quite capable of supplying the trade. It has necessitated, however, their working at their utmost capacity and sometimes overtime. Owing to the strong competition, prices continue low. We continue to quote on urinals and closets a discount of 15 per cent.

Cast Iron Fittings—Makers are busy keeping pace with the demand. Prices are firm: The discount is still 57½ per cent.

Solder—Half-and-half guaranteed bar is quoted at 25c per pound; wiping, 22 c. Business is active.

Metals—Much uncertainty and therefore, a serious depression exists in the old material market at present, owing probably, to the stringency of money in local circles and partly to the uncertainty prevalent in American circles. Prices are very weak and little or no demand for used metals exists. Copper continues week at $22. Lead is steady at $5.75 for bar; pig iron is firm and prices are strengthening. Present prices are for Middlesboro, No. 1, $21.50; No. 2, $20.50; Summerlee, $22.50. Heavy copper and wire, 15½c; light copper, 14½c; heavy red brass, 14c; heavy yellow brass, 10½c; light brass, 7c; heavy lead, 4c; scrap zinc, 3¾c; No. 1 wrought iron, $15.50; No. 2, $6.

CONDENSED OR "WANT" ADVERTISEMENTS.

Advertisements under this heading 2c. a word first insertion; 1c. a word each subsequent insertion.

Contractions count as one word, but five figures (as $1,000) are allowed as one word.

Cash remittances to cover cost **must** accompany all advertisements. **In no case** can this rule be overlooked. Advertisements received without remittance cannot be acknowledged.

Where replies come to our care to be forwarded, five cents must be added to cost to cover postage, etc.

FOR SALE.

FOR SALE—First-class set of tinsmith's tools, second-hand but almost as good as new; includes an 8-foot iron brick, almost new. Apply Pease-Waldon Co., Winnipeg.

HARDWARE, tinware, stove and plumbing business in manufacturing town in the Niagara Peninsula; no competition; $250,000 factory and waterworks will be completed this summer; stock about $3,000; death of owner reason for selling. Box 85, Thorold, Ont.

PLUMBER'S Cabinet for sale, cost $75, stands nine feet high and is 6 feet wide, contains 68 drawers, ranging in size from 3 in. x 3 in. to 6 in. x 18 in. Am installing larger cabinet, otherwise would not think of selling. Box 649, Plumber and Steamfitter, Toronto.

BUSINESS CHANCES.

WANTED—Partner to take half interest in one of the best hardware propositions in Algoma; plumber preferred. Box 636, Plumber and Steamfitter, Toronto.

OFFICE space wanted by manufacturer in Toronto: state location and terms. Box 645, Plumber and Steamfitter, Toronto.

SITUATION VACANT.

WANTED—A salesman familiar with plumbing supplies and gas ranges, to represent a Canadian manufacturer direct to the wholesale and retail trade; must have acquaintance with the trade; best of references will be expected; give full information concerning experience, acquaintance with the trade, salary expected; good position for the right person. Only those who can fill the above qualification need apply. Box 639, Plumber and Steamfitter, Toronto.

THE WANT AD.

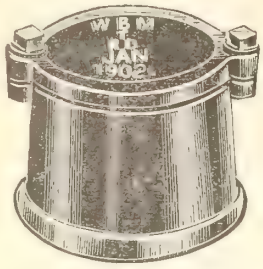
The want ad. has grown from a little used force in business life, into one of the great necessities of the present day.

Business men nowadays turn to the "want ad." as a matter of course for a hundred small services.

The want ad. gets work for workers and workers for work.

It gets clerks for employers and finds employers for clerks. It brings together buyer and seller, and enables them to do business, though they may be thousands of miles apart.

The "want ad." is the great force in the small affairs and incidents of daily life.



Malcolm's Cleaning Screw

The cheapest and best in the market.

A TIME SAVER

The cover can always be removed with ease.

MALCOLM & CO. - Toronto

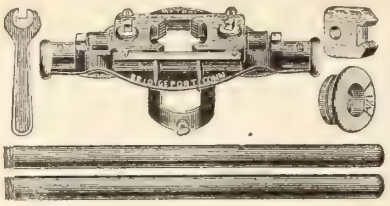
HIGH-GRADE FIXTURES

FOR THE LAVATORY

Ask for Catalog.

Are Manufactured By

The Carriage Mountings Co., Ltd., Toronto



The Armstrong Manufacturing Co.

317 Knowlton St., - Bridgeport, Conn.

Manufacturers of the Genuine Armstrong Stock and Die, Malleable Iron Hinged Vises, Pipe Cutters, Pipe Wrenches, Bard Adjustable Bushings, Ratchet Attachment for Stock, Pipe Threading and Cutting-off Machine--Hand and Power. Our goods are sold by all Jobbers.

CATALOGUE MAILED ON REQUEST

THE WORLDS BEST TUBE BENDER

KENNEDY'S PATENT

WM O. GREENWAY,

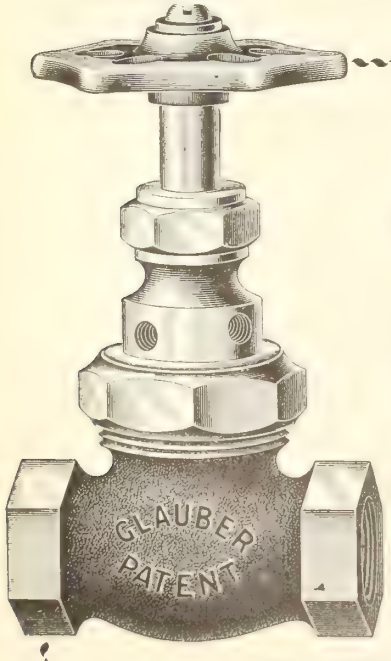
13, ST JOHN ST.,

MONTREAL.

No 2 Geared

NO HEAT REQUIRED.

apply for List.



Automatic

SELF DRAINING COMPRESSING

STOP AND WASTE COCK

The Only Self Draining Cock Made

Patent Features, Two holes in bonnet—Upper hole for air—Lower hole for waste—insures perfect circulation and automatic drain, no matter in what position cock is installed.

Interchangeable right or left. Quick operating stem. Made to stand Boiling Water as well as Cold.

GLAUBER FIVE YEAR GUARANTEE PROTECTS YOU

A Trial Dozen Will Make You Order More

CLEVELAND, GLAUBER BRASS MFG. CO. OHIO

If you can use High-grade Low Down Compression Basin Cocks with China Index Handles, ask for the Acme Brass Works Nos. 4, 5, 6 and 7 Basin Cocks, which are just what you want. They are the acme of perfection in style, workmanship and durability.

Write us to-day.
Do not delay for to-morrow.

Acme Brass Works

CLEVELAND, O.

MANUFACTURERS OF

PLUMBING GOODS

Gas and Electric Fixtures

The "Astoria" Low-Tank Combination

All our Low-Tank Combinations are furnished with our Improved Noiseless Ball Cock. The kind that last.

WE HANDLE

Enameled Baths, Lavatories, Sinks, Laundry Tubs, etc.

J.M.T. Cushion-Disc Bibb, Bath and Basin Cocks are accepted by the trade as that which is BEST in Compression Cocks—they wear longest.

The Smoke Test is the only perfect one. Get familiar with the THOMSON SMOKE MACHINE. Write for Booklet.
"Simple," "durable," "efficient."

Our "Astoria" Closet Combination is strictly "HIGH GRADE," has extra large Water Seal, Saddle Seat, extra large Tank, provided with our Improved Ball Cock or our new Combined Ball Cock with Shut-off. Piano-polished woodwork.

We design and make an extensive line of

Gas and Electric Fixtures

in combination with Art Glass, Crystals and Hammered Brass.

THE JAMES MORRISON BRASS MFG. CO. LIMITED
TORONTO ONT.

A TALK TO PLUMBERS

While we are not prepared to meet all the needs of a Plumber, we are more than ready to meet your wants in Pipe, Fittings, Globe, Gate and Radiator Valves and Dart Unions. We also carry a complete line of Steamfitters' Tools of exceptional quality.

Why not write to-day for Valve, Pipe and Steamfitters' Tools Catalogues ?

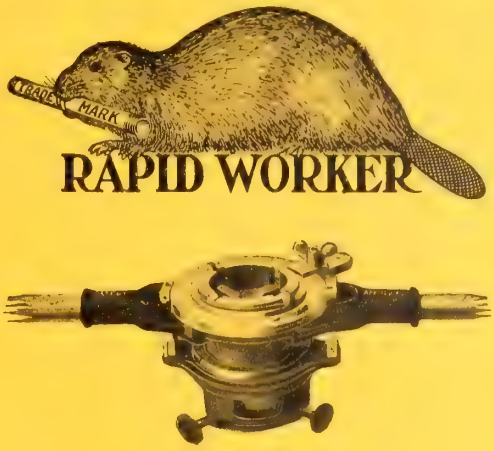
Canadian Fairbanks Co., Ltd.

Montreal Toronto Winnipeg Vancouver

Let Our Beaver Do Your Work.

You Don't Have to Change Dies.

Cuts 1, 1¼, 1½ and 2" perfect threads, all with one set of chasers



The Hand Stock that Starts Easy and Finishes Easier.

"The New Way."

You Will Find it a Sure-enough Beaver.

Write for our special 10-day trial offer

You cannot afford to take the time to thread pipe by hand in any other way

Come and see our Exhibit in Machinery Hall at the Exhibition.

Manufactured by

Borden=Canadian Company

166 Adelaide Street West, Toronto

It is generally admitted that the

"Sovereign" Heating System

familiarly known as Simplified Heating, is by far the most economical on the market.

"SOVEREIGN" RADIATORS

go far towards explaining this fact. They have a larger heating surface per loop, while the larger connection to all admits a free and easy circulation.

"Sovereign" Radiators are artistic in design and we can supply them to harmonize with any scheme of house decoration.

TAYLOR-FORBES COMPANY, Limited

Head Office and Works: GUELPH, ONT.

TORONTO—1088 King Street West. **MONTREAL**—122 Craig Street West.

WINNIPEG—The Vulcan Iron Works, Limited.

STANDARD Ideal CAST IRON PORCELAIN ENAMELLED WARE

is specially constructed to meet the requirements of the Canadian market. Dealers in Plumbing Equipment have a practical guarantee of larger profits and greater satisfaction in handling Standard **Ideal** Ware.

We supply Plumbers with cuts and special advertising copy, free.

We manufacture Bath Tubs, Sitz Baths, Shower Baths, Lavatories, Urinal Ranges, Slop Hoppers, Laundry Tubs, Sinks, Closet Ranges, Steamship Supplies, Railway Car Supplies, Hospital Appliances.

STANDARD Ideal COMPANY, LIMITED

Head Office and Factories: PORT HOPE, ONT.

SALES OFFICES AND SAMPLE ROOMS:

TORONTO,
50 Colborne Street.

MONTREAL,
128 West Craig Street.

WINNIPEG,
24 Telfer Block.

PLUMBER & STEAMFITTER OF CANADA

THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

MONTREAL, 232 McGill St. TORONTO, 10 Front St. E. WINNIPEG, 511 Union Bank Bldg. LONDON, ENG., 88 Fleet St. E.C.

Vol. I. No. 11. (New Series). Publication Office : 10 Front St. East, TORONTO, SEPT. 11, 1907. Old Series, Vol. XIX. No. 21

Nothing is too good for a good Job

Plate 556E.—China Base, Handle and Index Top.

Plate 557E.—China Handle and Index Top.

Brass Goods are Important on any Job.

WE HANDLE THE BEST

Prompt Delivery

SOMERVILLE LIMITED

59 Richmond St. East, TORONTO

Have U Used Our New No. 170½ Low-down Combination ?

This is guaranteed to be the simplest Low-down Combination on the market.

It is operated with a centre push and fitted with high-up ball cock and Douglas rubber float.

There are no levers to get out of order.

The James Robertson Company, Limited

265 King Street West, TORONTO

Plate 558E.—Push Button Self-closing Faucet; China Index Top

Plumbers' Brass Work

ALL THE

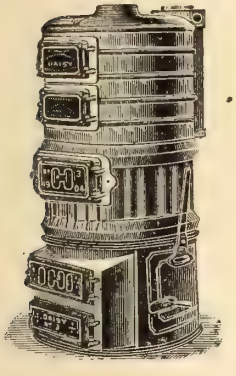
LATEST STYLES

PROMPT DELIVERY

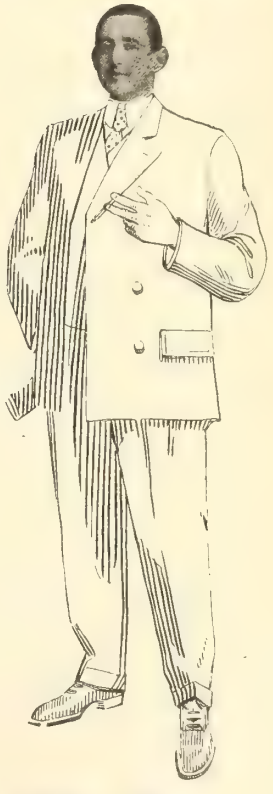
SOMERVILLE LIMITED

59 RICHMOND STREET EAST - TORONTO

Honest Ratings



The ratings of the Daisy Boiler are thoroughly honest and conservative. Every size has been carefully tested and its power accurately estimated, so that in figuring, the steamfitter is positive in gauging boiler capacity according to the published ratings. You will not be obliged to take out a Daisy.



Write for Catalogue.

CLUFF BROTHERS

Lombard Street, TORONTO

Selling Agents for WARDEN KING & SON, Limited

Monarch is "King."

MOST PLUMBERS USE

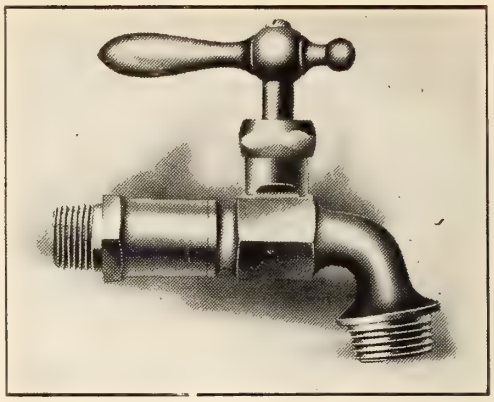
"MONARCH"

goods. All should.

Those who do, appreciate their worth; those who don't are the losers.

A Trial Order is Solicited

so we may have an opportunity to convince you of these facts.



FULLER COCKS

FULL LINE

COMPRESSION COCKS

QUICK-OPENING VALVES

The Monarch Brass Manufacturing Co., Limited

Factory: Port Colborne, - Ont.

Office and Warehouse: 278 Dundas St, - Toronto

MUELLER LINE OF COLONIAL HIGH-GRADE PLUMBING COODS

To some patrons Plumbing Brass Goods mean nothing more than the bare words signify. They are easily satisfied—a class that say "anything will do." There is another rapidly growing class, however, that see beauty of design, gracefulness of harmonizing curves and richness of finish. This class is not easily satisfied. They are discriminating persons of taste and select goods of

BEAUTY AND ELEGANCE

The Mueller Colonial Line appeals to this class and educates the other to desires for something better than the ordinary.

The Colonial Line of the Mueller Mfg. Co. has not been ruined by over-ornamentation but is strikingly attractive in massive appearance and absence of sharp angles.

WE WERE THE FIRST

to put the Colonial Line on the market and are the only makers of it. The line includes Fuller, Compression and Self-Closing work to meet all requirements of the trade. The proved mechanical principles of Mueller manufacture are used in this line. Unconditionally guaranteed. Write for prices and literature.

TRADE MARK
COLONIAL
REGISTERED

Works and General Offices
DECATUR, ILL.
West Cerro Gordo Street

H. MUELLER MFG. CO.

Eastern Division
NEW YORK CITY
254 Canal St., cor. Lafayette.

What Class of Men do You want to Reach?

We presume you want the largest number of resposes possible from the best class of people. This cannot result through using only local mediums.

Did you ever stop to think how many Plumbers and Steamfitters read any one of our large dailies? If you have a business for sale or wish to engage a clerk you will not be content to have your advertisement seen by men in any one locality. THE PLUMBER AND STEAMFITTER is not a Montreal, Toronto or Winnipeg paper. It is an ALL CANADIAN NEWSPAPER, and reaches practically all the men engaged in the Plumbing and Steamfitting trades from the Atlantic to the Pacific. Your message will be carried quickly. THE PLUMBER AND STEAMFITTER is mailed the second Wednesday of each month. On Thursday all subscribers in Ontario should receive their copy and by the end of the week your message will have been read by practically every Plumber and Steamfitter from Halifax to Vancouver.

Rates : 2c. per word first insertion
1c. " " subsequent insertions.

PLUMBER AND STEAMFITTER

MONTREAL TORONTO WINNIPEG

NIAGARA CHAIN *for* PIPE HANGING

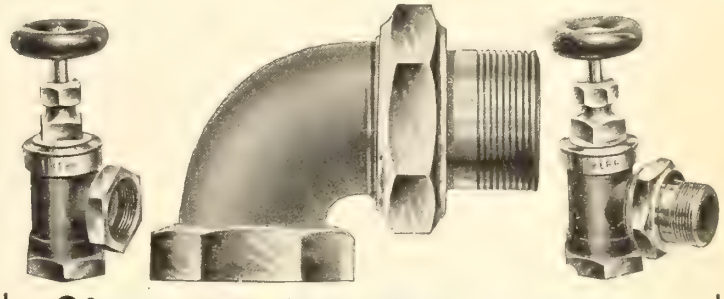
Most convenient and neatest as well as the most economical hanger on the market.

Pipe may be hung any distance from ceiling with this hanger.

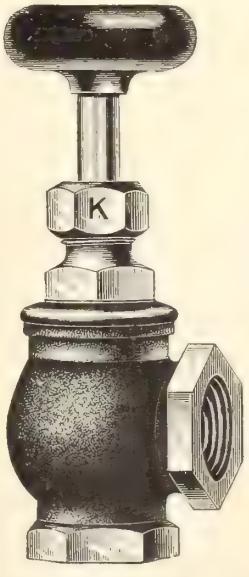
Permits of easy and exact adjustment.

Write for samples and prices.

ONEIDA COMMUNITY, Ltd.
NIAGARA FALLS, ONTARIO.



Steam & Hot Water Fitters



who handle KERR VALVES are the leading men in their line.

You should use Kerr valves for they improve your reputation for high-class work.

Made by a long established and responsible firm.

WRITE FOR CATALOG

THE KERR ENGINE CO.
Valve Manufacturers
LIMITED
WALKERVILLE, ONT.

Backed by a Guarantee

All our **Bronze** Powders and **Liquids** have the distinction of being **Guaranteed.** All plumbers and steamfitters know the necessity of having the **Best** in Bronze Powders and Liquids.

OURS NEVER FAIL

The Canadian Bronze Powder Works

MONTREAL—TORONTO

No order too large **Works at Valleyfield**

If your nearest dealer does not keep our goods, write us.

How to Figure Profits

An article by J. Malcolm Stewart, in the Furniture Journal, in which he contends a plumber did not get as much profit as he thought he did.

An article by J. Malcolm Stewart, in the Furniture Journal, in which he contends a plumber did not get as much profit as he thought he did.

Various letters have been received by the writer for more information on the subject of figuring profits on merchandise. The information desired is on the method of figuring those profits in the way most likely to avoid error, and unconscious losses, with the accompanying disaster that must overtake those groping in the dark. I contended that the only way to arrive at the proper percentage of profit on any commercial transaction, was to ascertain what proportion of the sale was, or would be, profit, never attempting to arrange the percentage of gain by adding to the cost, a percentage of that cost, equal to the amount of profit desired, or in other words, in adding 25 cents to a dollar, assuming you are making a profit of 25 per cent.

Of course, we all know that it is difficult to convince everyone on any subject, and bring them all to one way of thinking. In the case like the one before me it probably would be the best way out of the difficulty to refer those in search of information to the head of the office in any large wholesale house. A visit to any of these houses would, I think, furnish the seeker after information with plenty of it, all of which would be in favor of my contention. I would like much to see this matter brought before the public at large more forcibly than I ever could hope to do it, for, as one of my correspondents remarks, "It is a matter of the most intense and vital importance to the business world," and I might add, but little understood.

Only a few days ago, an amusing case came under my observation, going to show how poorly armed for business is he who doesn't understand this subject clearly.

Says the Plumber Figured Wrong.

A young business man, a plumber, strange as that may seem, was figuring on a contract. His labor and raw material, he figured, would cost him in round figures $500. Wishing to make a profit of twenty per cent. he proceeded to add twenty per cent. to the cost, making his complete bid $600. When he got through I asked him how much profit he would make at that rate if he did a business of $10,000. He answered with a knowing smile and triumphantly, $2,000. I asked him to apply the mode of reasoning by which he had reached that conclusion to the bid before him and see if it would work, and his surprise when he found it wouldn't was great. He had been doing business all along with the idea that adding twenty per cent. to the cost would give him a profit of twenty per cent. on his business.

It is not necessary to state that figuring one of these on the investment, the other on the amount of business,

JAMES W. HUGHES, MONTREAL
A Pioneer in Association Work in Canada and One of the Ablest Writers on Sanitary Subjects in America.

must lead to error. Don't say you understand that and provide for it. What is the use of doing that; why not figure right in the first instance? Try and find any advantage to be gained by figuring the profit on the cost. There is none that I know of. Ask some merchant who figures his profit on the cost the question I asked the plumber and see what answer you will get. A little study will convince any one with any business experience of the justice of my contention.

How to Figure Correctly.

To figure the profit on any article correctly: Subtract cost from the selling profit, the difference, of course, being the profit. Divide the latter (decimally) by the selling price, and the result will be the true profit; thus: Cost $5, selling price $8, profit $3, and $8 is contained in $3 .375 times, showing a profit of 37½ per cent. For the benefit of those who did not read the former article on this subject, I will repeat the table by which goods can readily be marked at any of the percentages common to business:

To make a profit of 16 2-3 per cent., add 20 per cent. to cost.

To make a profit of 20 per cent., add 25 per cent. to cost.

To make a profit of 25 per cent., add 33 1-3 per cent. to cost.

To make a profit of 33 1-3 per cent., add 50 per cent. to cost.

To make a profit of 50 per cent., add 100 per cent. to cost.

The highest profit that really can be made in business is 100 per cent., and this can be done only when you get something for nothing, and having sold it for something, the entire transaction is profit; in all other cases the sale being 100 per cent. and the cost something, the profit is less than 100 per cent. An article costing 10 cents and selling for $1 pays a profit of 90 per cent. of the selling price, 10 per cent. being the cost and 90 per cent. the profit. Figure your profits according to the above table, then try if you can to figure yourself out of anything.

How Rapid Turnover Counts.

As to the methods of proof submitted by me in these articles from time to time, I have this to say: Captious criticism doesn't amount to anything. The man who is constantly looking for an argument and trying to frame up impossibilities to prove his case only injures himself. I can say for those rules that I recently made an inventory, amounting to over $3,000,000 and consisting of over 40,000 hard extensions, and 1,500 pages of footing. I think I can figure as quickly and correctly as the next man, but I was glad to use those rules, proving any extension or footing I was afraid of by their aid. I was rewarded for my work by a fine present from the general manager, in addition to my regular compensation, he saying at the same time, "I would not believe it possible, but I have had your work carefully examined and have not found a single error." Of course, I was trying to use those rules, not abuse them.

The accompanying table shows the immense advantage of quick sales. It is based on the careers of four $100 bills invested in business for the term of ten years at a profit of 20 per cent., and turned over with their respective profits at various intervals. The difference in earning power is almost incredible, but can be easily verified:

$100 turned every two years at 20 per cent., profit for ten years will total	$ 305.18
$100 turned every year at 20 per cent., profit for ten years will total	931.00
$100 turned every six months at 20 per cent., profit for ten years will total	10,844.16
$100 turned every three months at 20 per cent., profit for ten years will total	891,752.50

PLUMBING AND HEATING PROBLEMS

In this department Canadian plumbers and fitters are invited to contribute questions to be answered or criticisms of any technical articles published in the paper. A frank and friendly discussion of trade problems should be helpful to all in the trade.

How Should Piping Be Planned?

The sketch shown below illustrates a boiler and four radiators, two of the latter containing 32 square feet, and the other two 18 square feet each.

Could these radiators be made to work properly with one main and return, or would it be necessary to have two mains and two returns, one pair for each floor?

Indicate by a rough sketch how you would pipe from a boiler to these four radiators and also give a list of the tees required.

The problem outlined above provides a subject for an interesting discussion and the editor invites letters of from 200 to 500 words in answer to the question.

One-Pipe Steam-Heating Job.

Regarding the interesting heating problem outlined in our last issue, the following has been received from a correspondent:

"In the steam heating job shown on page nine of the Plumber and Steamfitter, of August 28th, you will note that the return comes into the top of the boiler. This drawing was inadvertently shown with the return bull-headed. This was perhaps not quite correct, as the actual plant has the connection here, made with two elbows and the tee, further down the return to allow proper expansion in the system.

"In all work of this sort it will be found of great benefit to make the upright pipe which leaves the boiler at least one size larger than the horizontal which commences the run of the main—that is to say, in this job where there is a 5-inch main shown leaving the boiler and the same on the return pipe, it would be as well to use two 6-inch connections and use a 6 x 5-inch reducing elbow. The reasons for this are as follows:

"If you decrease the diameter of your main supply pipe, you increase the velocity of the steam in it. Now to increase the velocity of the steam in the pipe, just coming away from the boiler, is the very worst thing you can do, for, if the steam comes away with a very great velocity, it is very liable to carry particles of water up with it, while, on the other hand, if you increase the diameter of your pipe immediately coming away from the boiler, you decrease the velocity of the steam, and thus absolutely prevent any chance of particles of water leaving the boiler and entering your steam mains.

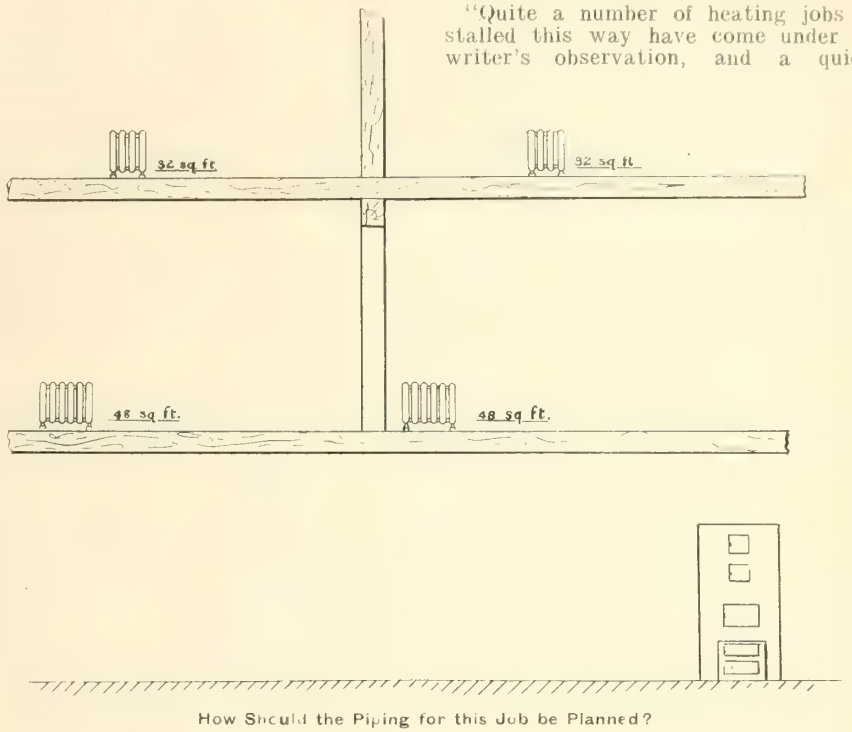
"This system when it is all simmered down is nothing more or less than the application of an old method often used by steamfitters in branches from the mains, only in this case we treat the main as if it were a branch. For instance:

"A steamfitter has sometimes a radiator which is situated some ten or twelve feet away from the main, and we will suppose it is a radiator of 44 square feet—in ordinary practice this would have an 1¼-inch connection into the radiator, and if it were not so far away from the main, you would use a 1½-inch connection from the main to the bottom of the stub, but, as it is an extra long run, the practice would be to increase the size of this horizontal run to 2 inches to the bottom of the stub instead of 1½ inches. Now in this branch the steam is traveling one way and the condensation the other, and provided the steamfitter has given the pipe the proper pitch, this will work perfectly without any drip being required from it at all. If it works in this branch, as before stated, there is no reason at all why it will not work in a main just as well, and this is the principle that has been applied to the lay-out.

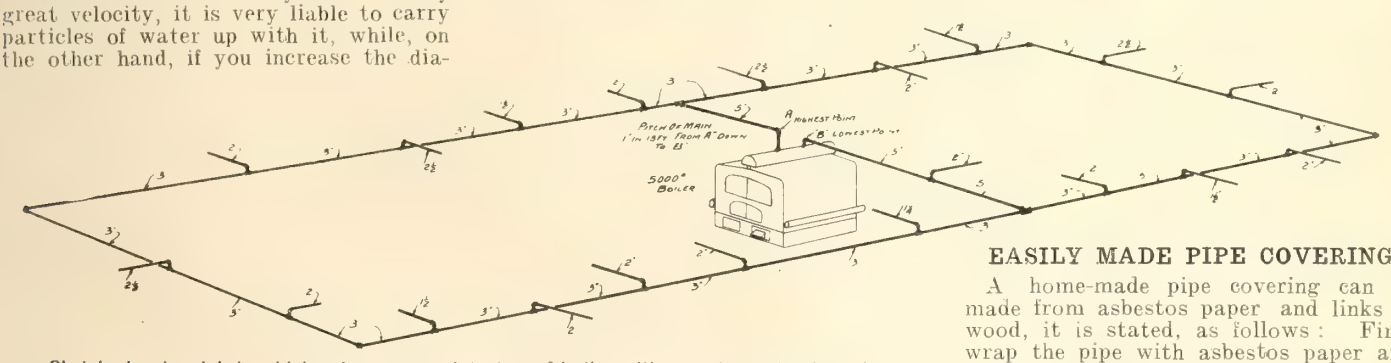
"It has also the additional recommendation, that the same size of main is used all the way round the circuit. Thus the steamfitter does not have to change his dies in cutting the main, and instead of having two tail ends on his mains he now has these tail ends turned into flows, thus making no dead ends in the job at all, and instead of only having two circuits, he has now four circuits, uses less pipe to accomplish this and makes the job heat just twice as fast. He also does away with all return pipes, effecting a saving there.

"Quite a number of heating jobs installed this way have come under the writer's observation, and a quicker heating and more noiseless job he has never seen. This system of piping will amply repay any of the trade, any time they may spend in getting familiar with it, as you get a better and quicker working job, using less pipe and less labor—two very important things in figuring a steam heating plant.

"W. L. H."



How Should the Piping for this Job be Planned?



Sketch showing job in which return comes into top of boiler with no return pipe into the return headers below the water line.

EASILY MADE PIPE COVERING.

A home-made pipe covering can be made from asbestos paper and links of wood, it is stated, as follows: First wrap the pipe with asbestos paper and then lay strips of wood lengthwise along the pipe, using five to ten of these, according to the size of the pipe, and binding them with wire or cord. Finally, wrap roofing paper around the strips. The spaces between the strips form a dead air space, which, of course, is a nonconductor of heat. At flanges, room enough may be left to give access to the bolts and the space afterward filled up with hair felt.

PLUMBER AND STEAMFITTER

OF CANADA

The MacLean Publishing Co.
Limited

JOHN BAYNE MacLEAN - - - President
W. L. EDMONDS - - - - Vice-President
H. T. HUNTER - - - Business Manager
WESTON WRIGLEY - - - Managing Editor

Publishers of Trade Newspapers which circulate in the Provinces of British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, Nova Scotia, New Brunswick, P. E. Island and Newfoundland

OFFICES:

MONTREAL - - - - - - 232 McGill Street
Telephone Main 1525
TORONTO - - - - - - 10 Front Street East
Telephones Main 2701 and 2702
WINNIPEG - - - - 511 Union Bank Building
Telephone 3726
LONDON, ENG. - - - - - 88 Fleet Street, E.C.
J. Meredith McKim
Telephone, Central 12960

BRANCHES:

CHICAGO, ILL. - - - - - 1001 Teutonic Bldg.
J. Roland Kay
PARIS, FRANCE - Agence Havas, 8 Place de la Bourse
MANCHESTER, ENG. - - - - 92 Market Street
ZURICH, SWITRERLAND - - - Louis Wolf
Orell Fussli & Co.

Subscription, Canada and United States, $1 00
Published Twice Every Month

OFFICERS OF NATIONAL MASTER PLUMBERS' ASSOCIATION.

Past President—F. G. Johnson, Ottawa.
President—John Watson, Montreal.
Vice-President—Joseph Laurier, Montreal.
Secretary—H. A. Knox, Ottawa.
Treasurer—Harry Mahorey, Guelph.

Provincial Vice-Presidents—
Ontario—Charles Taylor, Brantford.
Quebec—J. E. Walsh, Montreal.
Nova Scotia—F. Dexter, Truro.
New Brunswick—H. Dryden, Sussex.
Manitoba—A. J. Hammond, Winnipeg.
Alberta and Saskatchewan — E. J. Young, Calgary.
British Columbia—Bert Weeks, Vancouver.

Chairmen of Committees—
Legislation—H. J. Chandler, Ottawa.
Apprenticeship—J. A. Thibeault, Montreal.
Sanitary—L. Legrow, Toronto.
Essay—G. A. Wootten, Halifax.
Organization—H. McCauley, Montreal.

PECULIAR ENAMELWARE SITUATION.

The situation in enameled baths at present is rather peculiar, a drop of about ten per cent. having been made in the face of a strong market, the reason advanced being the slaughtering on the Ontario market of the surplus product of an American manufacturing concern.

Another interesting phase of the situation is the expansion, both real and probable, of the enamelware manufacturing industry in Canada. Readers of the Plumber & Steamfitter are familiar with the remarkable growth of the Port Hope plant of the Standard Ideal Company, building operations having never ceased at the works, and the output of the plant having been doubled in quantity several times. Likewise are they aware of the rise of the Amherst Foundry Company's business, its destruction by fire, and its present rebuilding upon a larger scale than before.

The coming to Canada of the Standard Sanitary Company, however, and the probable establishment of a branch plant at Toronto, is an event of national interest when coupled with the announcement that enameled lavatories are already being made at St. Johns, Que., by the Trenton Potteries Company, from the patterns of the J. L. Mott Iron Works, New York. The work at St. Johns is, as yet, in the experimental stage, but it is understood that the Mott people contemplate making a full line in Canada.

TECHNICAL EDUCATION IN QUEBEC.

The work of the Council of Arts and Manufacturers of the Province of Quebec will be of interest to readers of this paper in face of the fact of such deplorable lack of technical education in this country, and a short resume of its objects is worthy of consideration.

The council is composed of leading men of the province, including several members of the Legislative Assembly, and their work is really a part of the Department of Public Works and Labor. The object, as stated in the annual prospectus, is to provide free evening drawing and industrial classes, and to make the instruction as practical as possible, in order that the pupils may profitably apply the knowledge gained in the various trades and branches of industry in which they are engaged.

A subsidy of $15,000 per annum is granted by the Provincial Government, and this constitutes practically the whole source of income. The city council of Montreal grants the free use of rooms over the St. Lawrence Market for some of the classes, free of charge, which is all that is done by the City of Montreal in the cause. By means of this $15,000, educational work is carried on in nine towns throughout the province, Montreal being the headquarters and principal centre of work. Instruction is given in fourteen or fifteen subjects, and last year 2,258 pupils were enrolled, and showed a very high average of attendance. Instruction in plumbing and heating is given at three of the nine centres, viz., Montreal, Quebec and Levis.

Admission to these classes is entirely free to suitable persons above fifteen years of age, the only condition being a deposit of one dollar, which is forfeited if the student is absent on more than four occasions throughout the session. Examinations are held and prizes given at the end of the season's work, and an exhibition held in Montreal for the benefit of the friends of the students. For the plumbing classes, the prizes are found by the Master Plumbers' Association of Montreal, and the interest taken by the association in the progress of the students in this class is very encouraging. The good work done is very evident to any who visited the exhibition which was held in Montreal during June, and certainly is worthy of very much more interest than is accorded to it. On the evening of the 11th of June, the distribution of prizes was held in the Monument National, and great earnestness was shown on that occasion on this question of technical education by the Hon. W. A. Weir, Minister of Public Works and Labor; Archbishop Bruchesi, the Roman Catholic archbishop; the Hon. J. B. Prevost, and others.

Instruction in practical affairs of men given to youths who voluntarily seek it, is of very great value—beyond, in fact, what can be estimated, and here we find this instruction costing the miserable pittance of about $6.50 per head per annum. On all sides we find this question of technical education coming to the fore. We notice other nations, such as Germany, forging ahead in practical affairs, as a direct result of this specialized education; we deplore the fact that this country's need of properly skilled mechanics is dependent upon men trained in other places; we recognize the great demand of this country, and its resources for properly qualified men to realize its wealth, and yet we find the magnificent sum of $15,000 being spent on 2,258 of the youth of our country seeking after knowledge—a truly national asset. We learn of a grant of $5,000 being made by the Legislative Assembly towards the new Technical High School in Montreal, and we are glad because we recognize in it an awakening—if but a very slow awakening—to the need of the country in this regard.

What appears to be needed, though, is a real vision on the part of the people of the country, and of the men in power, of the tremendous need and even larger demand for technical training amongst the youth of this country, if Canada is to grow in the way we are looking for, and in the rightful way to achieve her destiny.

Conditions are different in different localities, which makes it difficult to make comparisons, much as we would like to do so on this question, but a few general figures and facts will form a clear enough basis to draw rightful conclusions. Huddersfield, a manufacturing town of the west riding of Yorkshire, with a population of just under 100,000 inhabitants, and an extremely large area, spends on its technical school the sum of approximately $42,000 per an-

num, and has a roll of about 1,550 pupils, a cost of $27 per annum. These pupils and expenditure are outside of the ordinary evening classes which are held at the common schools throughout the city, and which are provided for through another channel. Montreal, with a population of 400,000, has 1,475 pupils under the Council of Arts and Manufactures, at a cost of $6.50 per head, and now we learn of $5,000 more being granted to the Technical High School, to carry on evening classes. If Montreal was in proportion to Huddersfield, $168,000 per annum would be spent on technical education amongst the workers, and a student roll of 6,200 would be in evidence. And what of other portions of the province? Under the council there are but 783 students throughout the whole province, at eight centres, truly a pitiable show if only comparisons were made.

Two-thirds of the cost of technical education is borne by the citizens of Huddersfield directly. How much by Quebec, Sherbrooke, Montreal and other towns in this country? Of course the whole case is different, and we do not intend to make exact comparisons, but enough has been written to show how very far behind we are in this matter of importance. Surely it is time for the vision to come, if we are to realize anything of the nationhood that is within us.

ARE JOURNEYMEN DETERIORATING?

Some interesting reminiscences were recently given by Thomas Rich, who, with Ben. Noble, make up the firm of Smith Brothers, one of the oldest established and largest plumbing and heating businesses in London. Before launching out as master plumbers, the two were president and secretary of the journeymen's union and spent several years in practical work in the Western States. Since going into business they have undertaken some very large contracts, such as the installation of plumbing and heating systems in the Normal School, General Hospital and Tecumseh Hotel.

Talking of his experiences as a journeyman, Mr. Rich criticized the slowness of the modern workman in comparison with the journeyman of ten years ago. What a man used to do in ten days it now takes from fifteen or twenty days to complete, so much soldiering is done. During the strike in London last spring a two year "cub" did a job in 36 hours that ordinarily took a journeyman five days to do before the strike.

Mr. Rich compared these facts, which he said he could prove from the work docket on his books, with his experiences as a journeyman in London, Chicago, Omaha and other cities. In his day "pacers" were used and a man who could not complete a bath room job in practically the same time as the "pacer," could not hold his job.

While not desiring to uphold the "pacer" tactics (the use of which might tend to scamped work), although it develops fast workmen, Mr. Rich spoke of the demoralizing effect the present system has upon journeymen. Men who secure a practical control of the trade by a limitation of the number of apprentices and by discouraging apprentices to complete their term, are likely to develop the qualities of the loafer, become careless of their employers' material, (as well as his time), and gradually deteriorate as a workman, becoming as careless of his own interests as he is of his employers.

EDUCATION AND BUSINESS.

Young men about to enter upon a business career are too prone to undervalue the advantages to be derived from

JOSEPH THIBEAULT, MONTREAL
An Ex-President of the National Association, who was a Delegate to the Montreal Convention.

being well posted in even the more rudimentary elements of education. It is just here that the defects of the elective system of education, more especially in the lower schools, are suggested. Too many young men and boys have been allowed to choose their own course in the matter of primary education. Because they disliked such subjects as mathematics they were allowed to drop them and the consequence was that when they contemplated entering a business institution and commenced to take up book-keeping and expert penmanship they found themselves totally incapable of prosecuting their studies because they were lacking in the fundamentals. They could not add quickly or correctly, could not multiply, divide or subtract, without making serious mistakes, and worse than all, were unable to write a tolerably legible hand.

A little later, when the necessity of keeping their bread buttered presented itself they were forced to commence at the lowest rung of the commercial ladder and make up in experience what they lacked in knowledge of the theoretical side of the business.

Of late years to obviate the necessity of subjecting the more sensible of beginners to an insignificant beginning, trade schools have been established, at which the ambitious young man wishing to make his rise in the business as rapid as possible may attend at night and improve his opportunity at the hour when the thriftless and ambitionless are frittering away invaluable time at the theatre or some other centre of amusement. When we see young men making their way to the night school after, perhaps, a laborious day, in the earnest endeavor to improve their present circumstances so ruthlessly but undeliberately disfigured in their public school days, we can, with positive certainty, predict success for them in the future. The fact is that a large majority of the merchant princes of our time have not been the subject of destiny's partiality, but have had to lay with care and labor their own foundations for future success. They are the self-made men.

SANITATION MUSEUM.

The health board of Montreal recently appropriated to the city sanitary engineer, J. E. Dore, a spacious room in the city hall for use as a museum for the display of sanitary appliances. The collection will consist of antique specimens and newly patented appliances, all of which will be interestiog and instructive to those engaged in the plumbing trade. The display will serve a two-fold purpose. It will be open to public inspection and also will be used in the examination of plumbers. Their competence will be judged partly on their ability to identify odd specimens and describe them. This is but one instance of the increasing interest being taken in our civic sanitary systems.

ECONOMICAL LIGHTING.

Experiments were recently made in Munich to determine the cost and relative advantages of indirect illumination for school and draughting rooms. The arc lamp was found to give the best results, but intensifying gas burners more economical. This method of lighting has been strongly recommended to the school authorities.

Steam Heating in Practice

Article IV. — Heating a Public Library Building.

Written for this paper by W. B. Mackay, Toronto.

Considering again the question of the computation of the amount of radiating surface required to heat a room or apartment up to a proper degree of temperature, during the time when heating would be required, it will be found much more advantageous to have a fuller knowledge of the factors bearing directly on this phase of the design of heating systems. As stated in one of the first articles of this series, it will be the endeavor to avoid any complicated calculation, and also the use of technical phrases as far as possible, as it is felt that these articles will be made more readable on this account.

Heat is always given off from the warmer of two bodies to the cooler, therefore, based upon this law of nature, any room takes the form of a radiator if the surroundings are cooler, as is the case in cool weather. Heat is lost from a room principally by radiation from the windows and exposed walls, on account of the difference in temperature between the heated contents inside and the atmosphere outside. Needless to say, glass surface creates the greater loss of these two. Roughly speaking, one square foot of glass surface will transmit as much heat as four square feet of wall surface of the ordinary construction.

Simple Rule for Figuring.

A simple rule for determining the amount of radiation necessary to offset the loss by the glass surface in a room is to divide the total number of square feet of glass surface by four, and if the total exposed wall surface, minus the glass surface, be divided by fifteen, the result will be the amount of radiating surface required to offset the loss by the exposed wall surface.

There is still another factor in connection with the proper heating of any room or apartment, namely, what might be termed natural ventilation. The leakage of air through the walls, windows and doors of a room or apartment occasions considerable loss of heat. The quantity varies considerably, and it will be found necessary to use a little precaution in the determining of the amount of radiation required to maintain the air in the room at the proper temperature. If the windows and doors fit tightly, this leakage of air will not be so great, and of a consequence less radiation will be required.

To Determine Air Leakage.

The following will determine very closely the amount of radiation required for the natural ventilation or the leakage of air in a room or apartment.

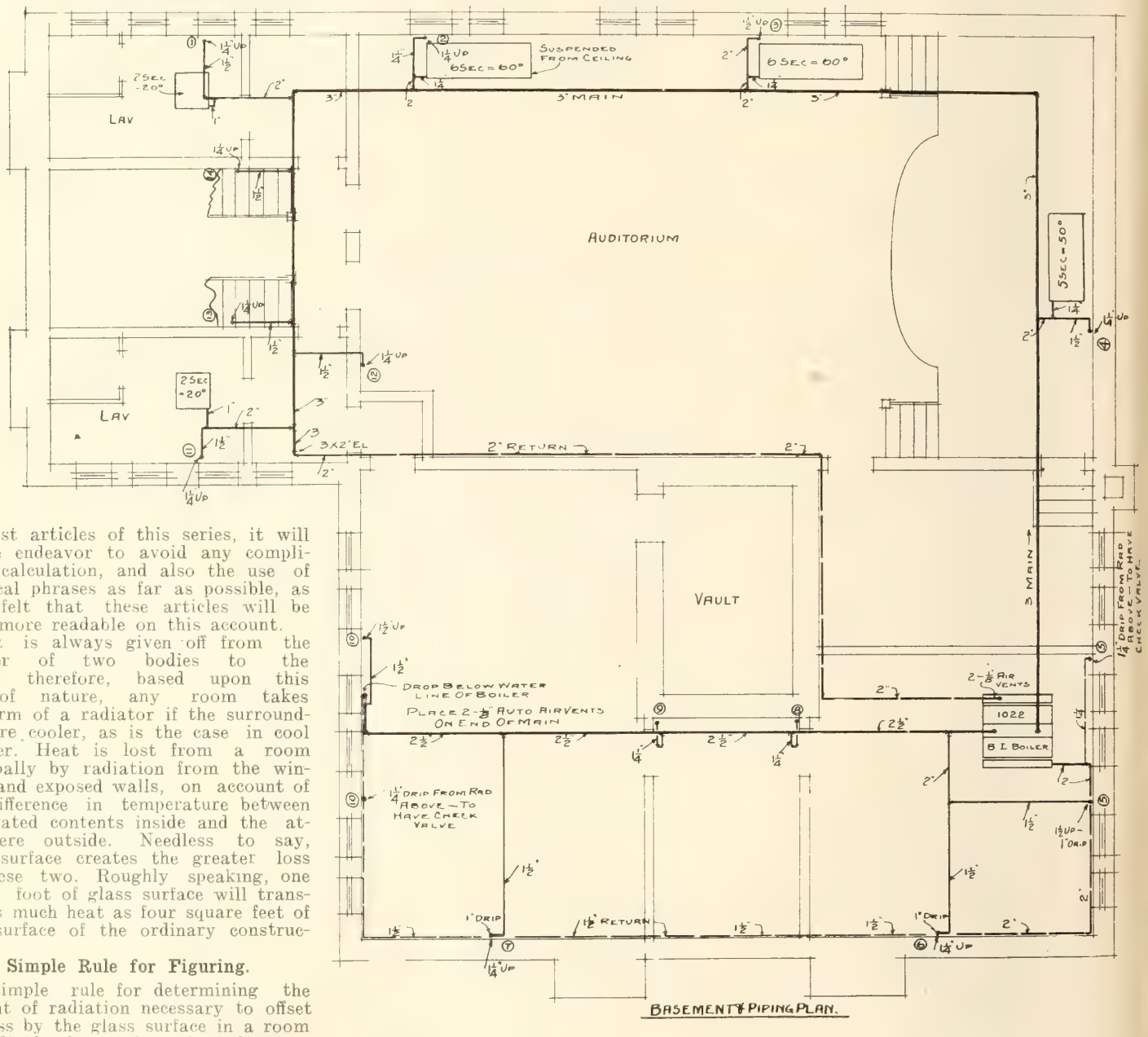
Living rooms on the ground floor—Divide the cubic contents by 100.

Rooms on first floors and floors above—Divide the cubic contents by 200.

Halls with doors opening outside—Divide the cubic contents by 50 to 75.

Churches, auditoriums, etc.—Divide the cubic contents by 200 to 400, depending of course upon circumstances. 1 square foot to 400 is used for large churches and auditoriums. For lodge rooms and smaller churches with considerable exposure, 1 square foot to every 200 cubic feet is more suitable.

Offices, banks, etc., vary—Divide the cubic contents by 100 to 200, according



to the conditions. Stores vary also according to the size and exposure. Divide the cubic contents by 100 to 200, using the division 200 for the large stores.

Estimating Radiation.

To arrive at the total amount of radiation required for a room or apartment, add together the amounts determined for the glass surface, exposed wall surface and cubical contents, making the necessary corrections for the directions of the exposures, etc. This will give the results on a basis of 70 degrees and zero. If other temperatures are required, refer to the following:

For 60 degrees at zero, multiply by 4-5.

For 60 degrees at 10 degrees below zero, multiply by 1.

For 60 degrees at 20 degrees below zero, multiply by 11-10.

For 65 degrees at zero, multiply by 9-10.

For 65 degrees at 10 degrees below zero, multiply by 11-10.

For 65 degrees at 20 degrees below zero, multiply by 6-5.

For 70 degrees at zero, multiply by 1.

For 70 degrees at 10 degrees below zero, multiply by 6-5.

For 70 degrees at 20 degrees below zero, multiply by 13-10.

Thus, for example, we have a room to heat which has 1,900 cubic feet of contents, 3 windows 6 ft. by 3 ft., totalling 54 square feet of glass, two sides exposed, which would give 200 feet of exposed wall.

54 sq. ft. of glass÷ 4=13½
200 sq. ft. of glass÷ 15=13 1-3
1,900 sq. ft. of glass÷100=19

Total radn. for room.....45 5-6
Add for exposure north and west, 10% 5

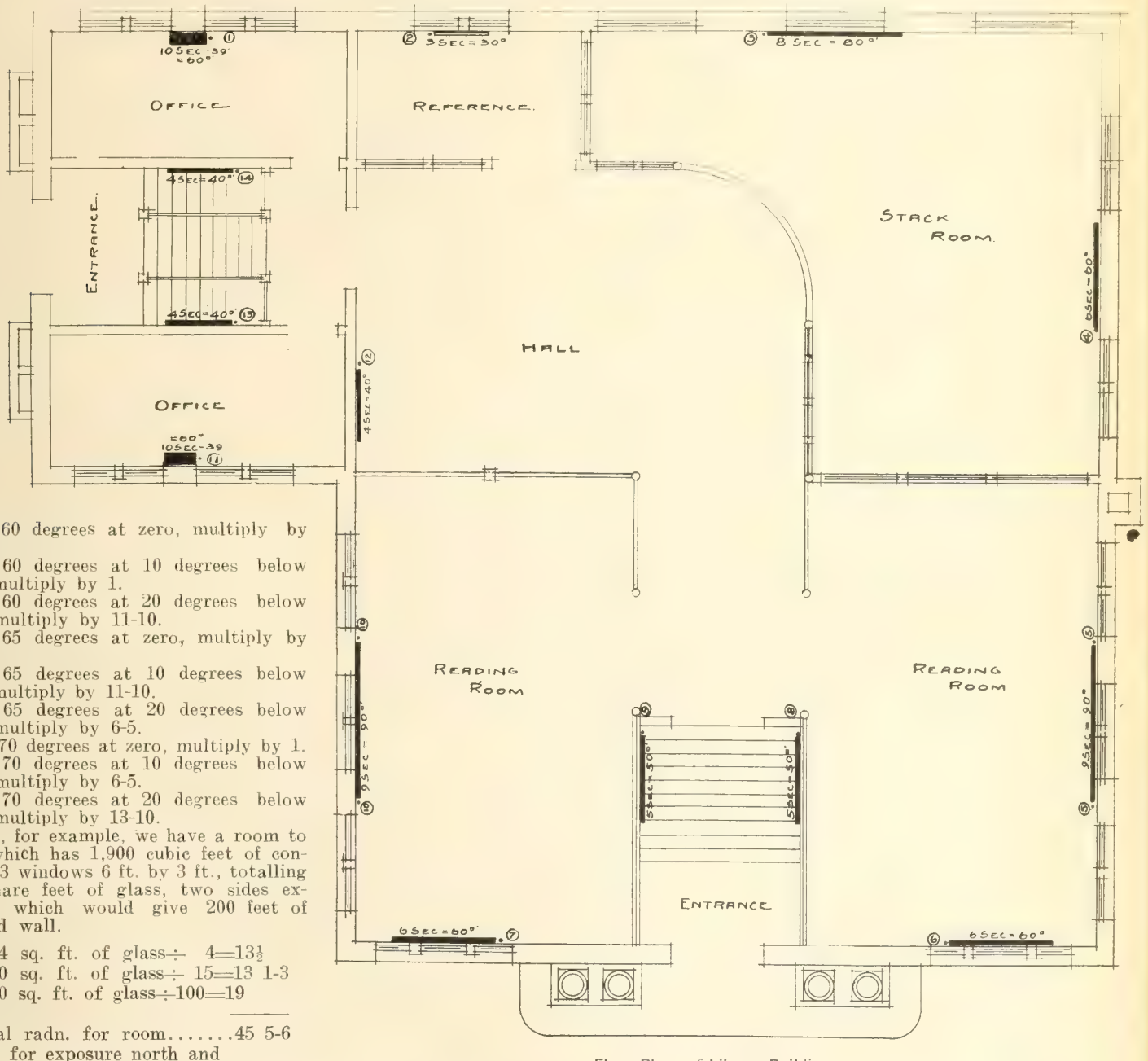
50 sq. ft.

Add for 70° at 20° below zero, 50×13-10, totals 65 sq. ft. of radn.

Allowances for Poor Construction.

These figures are calculated from formulae based upon actual tests. It will be found necessary, however, to make allowance for things that occur locally, such as brick walls left bare, no plastering, or plastered directly on the brick. As the figures are based on walls of good construction, it will be necessary to increase the radiation by a good 10 per cent. to make allowances for the much more active cooling surface.

When the roof forms the ceiling of a room, as is sometimes the case, in church buildings, it should be figured as actual wall surface, but when a room is ceiled over, and has a space between the ceiling and the roof, the exposure may be taken at about 50 per cent. of the total.



Floor Plans of Library Building

Plans of Library Building.

The accompanying illustrations show the floor plans of a public library building and the rules outlined in the preceding paragraphs will give the proper amount of radiation for these rooms.

In the main room of the library shown, on the ground floor plan, about 70 degrees at 0 degrees is required. It is necessary to figure the ceiling at 50 per cent. exposed, on account of the roof over.

The radiation amounts to 1 square foot to about 60 cubic feet of contents, using wall radiation; about 15 per cent. more would be required if ordinary 2 or 3 loop radiators are used. The amount of radiation required to take care of the cubic contents of this room, or the natural ventilation, should be taken at about 1 square foot for every 150 cubic feet. In the case of the auditorium in the basement, the exposed wall surface is only that part above ground exposed to the outside temperatures, less the amount of glass surface. The cubic contents divided by 200 seems to be the amount to take off that factor, there being no direct connection with the outside air.

It will be seen from the plans that

the boiler sits on the same level as the floor of the auditorium, so it is impossible to stand the radiators on the floor, as they would be below the water line of the boiler. It is necessary, therefore, to suspend them from the ceiling, keeping them higher up than the steam main, so that the condensation may find its way out of the radiators by gravity.

Piping System.

The piping system mapped out follows what has been discussed in previous articles. It will be noticed that the mains are carried full sized throughout. In the case of the shorter, a wet return is used, the return pipe being brought back to the boiler along the wall, below the water line of the boiler as indicated on the plan. The main running through the auditorium, is carried back above the water line of the boiler, so as not to obstruct doorways, and to save trenching. This last arrangement is known as a dry return.

A point here arises in connection with the heating of this auditorium in the basement. If the mains are left uncovered, the surface of the pipes becomes active, radiating surface, so that for the number of square feet of surface in the mains, just so much may the radiation be decreased.

The following shows the amount of surface in square feet in 100 lineal of the standard sizes of pipe:

1	inch	34	square feet
1¼	"	43	" "
1½	"	50	" "
2	"	62	" "
2½	"	75	" "
3	"	92	" "
3½	inch	105	square feet
4	"	118	" "
4½	"	131	" "
5	"	146	" "
6	"	173	" "

In treating with the sizes of mains required for ordinary low pressure steam heating, the table given below is one revised from the best practiced, and is shown in its simplest form, to enable one at a glance to choose upon the size of main required. It might be stated that for ordinary practice, where the mains do not exceed 100 feet in length, the sizes tabulated are ample to carry the amounts of radiation in the table. However, local conditions should be carefully considered, to secure good results. In the table opposite each size of main is shown the corresponding size of return main.

Size of mains and returns for one pipe steam heating:

Amount of radiation not exceeding	Size of main.	Size of return.
125	1½ inch	1¼ inch
280	2 inch	1½ inch
500	2½ inch	1½ inch
900	3 inch	2 inch
1250	3½ inch	2½ inch
1800	4 inch	2½ inch
2700	4½ inch	3 inch
3700	5 inch	3 inch
5500	6 inch	3½ inch

NO COMBINE IN HAMILTON.

Hamilton plumbers are indignant over certain insinuations which have been made in that city lately relative to the existence of a plumbers' combine. The statement that such an organization existed is said to have originated with one of the aldermen, as the result of the attitude of the plumbers toward the contract which was let some time ago for a new police patrol station. In response to the call for tenders only one plumber submitted figures, and the aldermen, after opening the tender, refused to accept it as it was too high. Another request was made for tenders, and this time another plumber offered to do the work for about $100 less than his former confreres. This caused one of the aldermen to say that the reason that more tenders were not received was because the plumbers had an understanding among themselves by which they were not to compete against each other on contracts.

R. J. McCAULEY, MONTREAL
The Chairman of the New National Association Organization Committee and His Little Sweetheart.

A prominent plumber and former member of the Plumbers' Association, flatly denied that there was any combine in Hamilton, and explained the plumbers' attitude regarding the patrol station contract by the fact that the plumbers were so busy that they did not consider it worth while to tender on a city job, since there is so much red tape about such matters.

There is not in human nature a more odious disposition than a proneness to contempt, which is a mixture of pride and ill-nature. Nor is there any which more certainly denotes a bad mind, for in a good and benign temper there can be no room for this sensation.—Fielding.

USE OF LEAD FOR WATER PIPE.

The employment of lead for pipes used in the distribution of drinking water has frequently been the cause of unsuspected cases of poisoning, in fact, so deleterious is the action of the lead on pure water that in certain continental countries the use of lead pipes for water supplies has been wholly forbidden, and in Austria it is not even allowed to employ galvanized iron pipes for this purpose, says an English exchange. It is stated that the more pure the water the more liable it is to dissolve lead, and as the toxic action of lead is cumulative, and as this metal once absorbed remains permanently in the system, it is a most insidious and dangerous poison. It is a somewhat singular fact that no action of the lead with water takes place in the absence of air, but that in contact with air lead hydroxide is formed, which is slightly soluble. Carbon dioxide, when present in water, especially if contained under pressure, as in the case of bottled mineral water, greatly intensifies the solvent action on load, and the presence of certain other dissolved substances in the water renders the attack on the lead more rapid. This is notably the case with certain organic compounds, and small quantities of ammoniacal salts, especially the nitrates, while water with traces of phosphates and carbonates of lime remains almost entirely without action on lead. It is, perhaps, for the former reason that peat water, which is rich in humus, is liable to dissolve lead, while many very pure waters can be protected from lead by filtration through chalk or animal charcoal, which enables them to dissolve enough of the calcium carbonate or phosphate to prevent the solvent action. The use of lead for very pure supplies of water, especially under circumstances where the pipes are liable to run alternately full and empty, and thus admit air, should in all cases be avoided.

BOOK REVIEWS.

John K. Allen, editor of Domestic Engineering, Chicago, has written an interesting little work of 63 pages, entitled "Swimming Pools," the first book devoted to plans, water heating and supply, designs and construction of swimming pools. The work is thorough and should be studied by every architect and plumber called upon to construct public baths in Canadian cities The book sells at 50 cents, and is sold in Canada by the Book Department of the MacLean Publishing Company, Toronto.

* * *

"Plumbing Catechism" is the title of a small pocket size book written by C. B. Ball and H. T. Sherriff, two able American sanitarians, and recently published at $1 by Domestic Engineering. The contents are in question and answer form, particularly suitable for students in trade schools, apprentices or others desirous of making a study of plumbing work. The book is also a handy and up to date work for reference. It can be purchased in Canada from the Book Department of the MacLean Publishing Company, 10 Front street, Toronto.

ATTRACTIVE DISPLAY OF PLUMBING SUPPLIES

The James Robertson Company, Toronto, had a decidedly neat exhibit near the middle entrance to the Process Building, the same location as the exhibit made by the company last year. Improvements had been made, however, by the addition of an artistic roof to the two booths, and the display, therefore, was enhanced in beauty and general appearance.

In the bath room were samples of the most modern fixtures, a highly decorated Premier bath on a solid base being the centre of attraction, and fitted above it was one of the latest patterns of shower baths, while modern fittings were used throughout. A magnificent Copley lavatory was the second feature in the room, the lines of its design being very artistic, while combining all the features of efficiency in operation. In place of the Sitz bath displayed a year ago, a serviceable foot bath was shown, the fixtures being rounded up by the addition of a beautiful Naturo closet with flushometer connections. The room was well lighted and contained every requirement for the modern bath room.

The main display in the corner exhibit had as its chief feature many different designs of beautiful lavatories, including several marble lavatories in artistic new designs produced in the Robertson Marble Works. These contained permanent fixtures, such as shelves and brackets for various articles used in the lavatory. The different types were all greatly admired, but none more than two pedestal vitreous white china lavatories also on display.

On the floor were also beautiful samples of highly decorated Yale, Occident and Gladstone enameled baths and nickeled fittings. The outside decorations attracted much attention from visitors to the exhibit. One of the latest models of kitchen sinks was also shown, with both enameled iron and wooden drain boards fitted with rubber mats. This feature of the display attracted the eye of many a housewife who has older and less sanitary fixtures now in use.

The closets on exhibition included the Naturo, Acme, Acme Centripetal and Fleur de lis, all being fitted with Robertson's centre bush fittings and top supply ball cocks. With this modern apparatus for flushing closets, nothing can get out of order. The operation of the apparatus is exceedingly simple. As will be seen from the picture, the push button is located in the centre and near the top of the tank.

The Marble Bathroom in the James Robertson Exhibit.

Canadian National Exhibition. Exhibit of James Robertson Co. Ltd.

Modern Conveniences for Farm Homes

The Fourth of a Series of Articles Intended to Help Canadian Plumbers in Educating Residents in Country Districts to the Necessity of Better Sanitary Arrangements.

By Elmina T. Wilson, C.E.

Earth Closets.

Where there is difficulty in the matter of ultimate disposal without the use of a cesspool, and the consequent and apparently unavoidable risk thereby incurred of contaminating the well water, it would be better to use an earth closet. This is not wholly satisfactory but is safer and far better than the provision so often found on farms and in villages. The house containing it should be well built and substantial, well lighted and ventilated, with a good roof, and preferably plastered on the inside to insure less exposure in cold weather. A carefully made and dry walk, screened by lattice for protection from the wind and for privacy, should be built to it. The excretia should be received in a galvanized-iron pail, not too large and made to fit close under the seat. This seat can be like that of an ordinary water closet. Each time the closet is used dry earth is added. The pail should be emptied very frequently With proper attention this closet need not be, and should not be, built far from

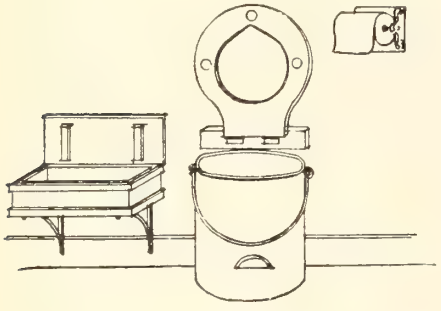


Fig. 7. Earth Closet.

the house. It would even be possible to place it in a room built against the house, the room having one door opening from the house and another opening out of doors. This would make it possible to enter from the house in inclement weather, and also to carry out the pail without passing through the house. The room should be well ventilated by a window close to the ceiling, and only tissue paper should be used. (See fig. 7 for arrangement of pail, seat, and dry-earth box).

The earth for use in these places is to be found in nearly every field and garden and should be of rather a loamy nature if possible, and porous. A very sandy soil is next to useless. Large heaps of earth should be collected for the year's use and dried in the summer sun. It is not necessary to use perfectly dry earth, but it is always the best.

After the plumbing has been put into the house, to make it effective, a means must be provided to remove all liquid wastes as soon as possible and to prevent the return of odors.

As has been previously explained, to build a cesspool to foul the ground and air is not a solution; it is only putting the trouble "out of sight." It holds the wastes in a state of putrefaction, and so will give off troublesome gases, which will, if near the house, penetrate to the cellar and then on through the house. Its liquid leachings, if these strike a layer of sand and gravel or a fissure in the rock, will penetrate an unthought-of distance to injure the quality of water of wells and springs. Such a system would never be installed if the householder realized the full effect of the nuisance he was establishing. Fortunately it is no longer necessary to build a cesspool when plumbing is introduced into the house which can not be connected to a public sewer.

Modern Sewage Disposal.

Within the last twenty years many investigations of sanitary methods for the disposal of sewage for isolated houses have been made. The working principle is this: When the air contained in the soil is brought in contact with dead organic matter in a finely divided state, a complete transformation takes place by the natural processes of oxidation and nitrification. This change is brought about by micro-organisms which multiply rapidly under proper conditions and by so doing combine the oxygen of the air with the organic matter. Air is as necessary for this purpose as fuel in a stove that is required to give off heat. It is therefore essential that the waste be deposited on or near the surface of the ground and in such a way that air reaches every particle. If the ground is saturated for a long period of time purification of the liquid will cease. If a foul liquid is thrown on the surface of the ground the water will pass off, but its organic impurities will cling to the particles of earth. Air takes the place of the water and surrounds the waste matter, the bacteria present in all fertile soils effect a combination between the two, converting the dead organic matter to harmless mineral forms needed for vegetable life. This process may be repeated indefinitely if the waste matter be supplied and the air furnished alternately. This is called the "intermittent method" of operating the disposal plant. The process of applying this principle to the disposal of sewage varies, and may be divided into two distinct steps: (1) The collection of the wastes from the house, that these may be applied intermittently; and (2) their application to a natural soil by surface or subsurface irrigation, or to a specially prepared soil, as in a filter bed.

Three Systems Described.

The ground available on one farm can not be, and need not be, exactly the same as that used on another. If the surface is almost level and under cultivation the subsurface system of distribution could be adopted, whatever the method used for collecting the flow from the house. The liquids are retained for a certain length of time and then rapidly discharged into open-jointed tiles, laid near the surface, thus securing a uniform distribution throughout the entire length of the drain. While the tank is refilling time enough is allowed for the water to pass away and the air to enter and accomplish its work. This manner of purifying the liquid wastes of the household where the water-closet is or is not used has been tried with entire satisfaction.

Another method of getting the liquid wastes on the land is by surface irrigation. The most marked feature of the change from the privy to the water carriage system is the great dilution which

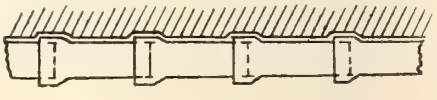


Fig. 8. Method of laying Vitrified Pipe.

the organic matter undergoes. Instead of concentrated organic wastes, unsuited for direct use as a fertilizer, we now have a dilute mixture, which seldom contains more than 1 part in 500 of anything but water. Of course this can not be discharged in a haphazard manner upon the land, but if the intermittent method, as explained above, be followed and the discharge be regulated to avoid saturation of the ground, the sewage can be disposed of without unsightly or offensive results. The area of the ground required is about the same as for subsurface disposal. A sloping surface in grass, or partially wooded, or a cultivated field, say of corn, would be entirely suitable. The area required depends upon the character of the soil and the amount of sewage to be purified. For a family of five, if the soil be reasonably porous, a plat of ground 40 feet by 50 feet should be ample.

The third method of exposing the liquid wastes to the action of the bacteria is used when the available area of the land is limited or if on account of the character of the soil too large an amount of drains would be necessary to handle the sewage to be purified. Under

these conditions specially prepared beds of sand, gravel, or screened cinders are used as a filter material. The sizes of these beds vary with the amount and character of the sewage and its previous treatment, but for a family of five under reasonable conditions and a proper preliminary treatment, a bed 25 feet long, 4 feet wide and 4 feet deep should answer, although one 5 feet deep would give a purer effluent.

Collecting Liquid Wastes.

As has been pointed out in the previous paragraphs, intermittent application is the key to success, and in order to apply the liquid waste or sewage to the land intermittently it is necessary to collect the irregular flow from the house in some manner.

The house drain of cast-iron pipe extends at least 5 feet outside of the foundation wall. From this point to the collecting chamber vitrified sewer pipe is used, except in made ground, or in quicksand or where the drain must pass near a well, when cast-iron pipe should be provided. The drain should be given a uniform fall, if possible, and should be at least 3 feet below the surface in cold climates, to avoid freezing. The greater the inclination the less the liability of obstruction. A fall of 1 foot in 40 or 1 foot in 60 feet is desirable; 1 foot in 100 feet is the least that should be used unless special flush tanks are provided. The bottom of the trench should be dug to the exact grade and shaped to fit the lower half of the pipe, with grooves cut for the sockets as shown in figure 8. Inspection and cleaning hand-holes should be located about every 50 feet, and their exact location marked on the plan of the drain, to aid in locating obstructions, if any should occur. Change of direction of the pipe line should be made with special curved pipes of large radius.

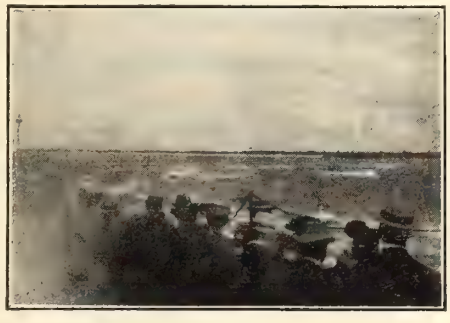
Making the Joints.

The joints of the pipe should be well made. The space between spigot and hub should be filled first with a small rope of picked oakum, rammed into place with a hand iron to prevent any cement mortar from entering at the joints. Then fill the remainder of the space with a mortar made of one part Portland cement and one part clean sand. The cement and sand must be thoroughly mixed dry and wetted up only as needed. The bottom of the joint should be made with particular care, using the fingers to press the mortar into place. As soon as the joint is finished the groove in the trench should be filled with earth to prevent the joint being broken before the cement has time to harden. The inside of the pipe must be thoroughly cleaned from projections of oakum or cement. If the drain passes close to trees the joints should be tested by closing the main outlet and filling the pipes with water. Leaky joints are undesirable, both because of the contamination of the soil and because the liquid is needed to carry the solid matters through the pipes.

The volume of the sewage is practically equal to the water consumption. The waste matter received increases the volume very little, 1 pound in 120 gallons is organic matter, to remove and destroy which is the purpose of the "disposal plant." The garbage or kitchen refuse, of course, is not included. This 1 pound of organic matter with its 120 gallons of water is all carried by the house sewer to a suitable place, the distance from the house varying with the surrounding conditions, and collected in a chamber to which has been given various names, according to the manner of use proposed. We have the "flush tank," the "settling chamber," and the "sseptic tank" and these may be so constructed and used that it is difficult to draw an exact line between them.

TORONTO PLUMBERS' STRIKE.

After nearly four months' duration, the Toronto plumbers' and steamfitters' strike is still unsettled and the dividing line between the main contentions of the men and those of their employers apparently is as tightly drawn as ever. With the approach of fall, however, the men seem more anxious to effect a settlement and with this end in view the Journeymen Plumbers' Union recently requested a conference with the Manage-



RUNNING THE LACHINE RAPIDS.
A group of Convention delegates on the bow of the boat.

ment Committee of the Master Plumbers' Section of the Employers' Association and submitted certain amendments to their agreement of Feb. 12th, with the idea of having the amended agreement signed by the Master Plumbers.

The union's letter was as follows :

"Mr. Gordon Ritchie, Secretary Master Plumbers' Association.

"Dear sir :

"In reference to conversation with your committee of management on the 22nd inst., I beg to inform you that at the regular meeting of Local Union No. 46, held last evening, a resolution was adopted, giving our Strike Committee full power to arrange settlement of matters in dispute between your Association and Local Union No. 46. In accordance, therefore, with the suggestions made at our previous meeting of August 22nd, we make the following proposal that Clauses 7 and 8 of the agreement submitted to your Association on Feb. 12th of this year, be amended to read as follows :

"That all apprentices be paid not less than $7 per week in their fourth year and not less than $9.50 in their fifth year.

"Clause 8. That the minimum rate of wages shall be 40c per hour and all journeymen shall receive a general advance of 2½c per hour.

"We make this proposal with a view of a speedy settlement of the matters in dispute.

"Yours respectfully,
"Geo. S. Kingswood,
"Secretary."

Concerning the two sections referred to, the agreement of Feb 12th provided for a minimum wage of 45c per hour and apprentices to be paid not less than $8 in their fourth year and not less than $12.50 in their fifth year. The proposed amendments provided for a minimum wage of 40c and apprentices $7 a week in their fourth year and $9.50 in their fifth year. In all other respects the agreement stands as originally submitted, containing all the other features objected to by the Master Plumbers.

The whole question was carefully considered at a meeting of the Master Plumbers, and it was unanimously decided to forward the following letter in reply :

"Geo. S. Kingswood, Esq., Secretary Local Union No. 46, Journeymen Plumbers, Gas, and Steamfitters.

"Dear Sir :

"Your letter of the 24th inst. containing amendment and modification of agreement submitted on February 12th was carefully considered at the regular meeting of the Master Plumbers' Association, and in reply I have been requested to call your attention to the fact that your communication deals with wages alone, which is not the real question at issue, as the Master Plumbers have always expressed a willingness to pay skilled mechanics the highest wages, asking only a fair day's work in quality and quantity in return.

"The only dispute between the Associations, as a matter of fact, is the signing of the agreement, and a little consideration must make it apparent that such an agreement can have no practical or financial advantage to you, as the Master Plumbers work the hours, pay wages to the men who can earn it, and in every other particular practically conform to the conditions of your agreement, but they cannot and will not sign any agreement which prevents men who are not members of your Union from obtaining employment in their shops.

"The Master Plumbers are well aware that the proposed agreement does not specifically mention that non-union men cannot be employed, but they are equally well aware of the fact that signing an agreement means union domination of their shops to the exclusion of all other men equally capable and just as competent to do their work.

"Under these circumstances I have been instructed to advise you that it would be a waste of time to discuss the signing of an agreement, as the Master Plumbers are firm in their determination to operate and maintain an 'Open Shop.' They will give employment to all men, union or non-union, who are capable of doing their work, and their employes will have every assurance that they will receive just and

honorable treatment and fair compensation in return for a loyal and faithful performance of their duties.

"Yours very truly,

"Gordon Ritchie, Secretary Master Plumbers' Section of the Employers' Association."

It will thus be seen that the Employers' Association have decided that the "Open Shop" shall be maintained at all costs, and consequently the negotiations which had been going on for some days have been broken off.

As soon as the employers' decision was made known to the men at a mass meeting of the local union in the Labor Temple, it was unanimously decided to withdraw the modified terms submitted to the employers and continue the struggle. The men are greatly incensed at the bosses' action and indignantly claim that these modifications were made at the request of some of the larger employers, who desired to bring about a settlement. The following reply sent to the employers by the union, shows how the situation rests at the present time :

"Toronto, Aug. 31, 1907.

"Gordon Ritchie, Esq., Secretary Master Plumbers' Associatian :

"Dear sir :

"Your letter of the 28th inst. to hand. In reply I beg to say on behalf of Local Union No. 46 we regret that your association has refused to discuss the matter in dispute between the two associations, in order that an amicable settlement might be arrived at. Vide obligation as per constitution of the Employers' Association. Our object in making the proposals referred to was to ensure the accomplishment of such settlement as speedily as possible, in order that the best interests of the general public and the two associations might be served. You, of course, will understand that having made our proposition for a specific purpose, such proposition having been rejected by you, your association must assume full responsibility for the continuance of hostilities.

"In the meantime, we revert to our original propositions. Your statement that it is not a matter of wages at all, is quite ingenuous. As a matter of fact it is a matter of wages that separates us, though you seek to conceal that fact under the plea that you merely want the 'Open Shop,' which means that your association wants employers to have the power to act as sole arbiters of the ability of each individual workman.

"This assumption on your part we find ourselves wholly unable to agree with. We claim the same right in the matter of the disposal of our labor that is enjoyed by yourselves in the disposal of any material you may wish to sell, viz., the right to set the price at which you will sell it.

"As to your refusal to sign an agreement, we would say you are inconsistent to the extent that you are all members of an association, which dictates to each member the course he is to pursue in dealing with individual workmen and our experience is that the employer under such circumstances almost invariably takes advantage of the situation to the detriment of the workmen and the general public.

"Yours respectfully,

"George Kingswood,

"Secretary Local 46."

PLUMBING AND HEATING MARKETS

TORONTO.

Toronto, Sept. 8.—Business in plumbing supplies continues a trifle dull and the local markets do not show as much activity as they should for September. However, considering the fact that, after a duration of almost four months, the plumbers' and steamfitters' strike is still on in this city, the volume of trade for the first week in September is fully as large as jobbers expected it would be. Most of the large plumbing supply houses here went to considerable expense and trouble in setting up elaborate exhibits of brass goods and bath room fixtures at the Toronto Exposition, and from the amount of extra inquiries already coming in, it is quite evident that the firms referred to will reap large results from these displays in the way of increased sales.

Iron Pipe—The demand continues very strong, with supplies entirely inadequate to meet the needs of the trade. Practically all sizes from ½-inch to 1¼-inch are very hard to procure and the manager of one of the large supply houses here stated to-day that at one time last week it would have been an impossibility to obtain two hundred feet of 1¼ pipe in the city of Toronto. As the import duty on pipe up to four inches is thirty-five per cent., no relief can be looked for from outside and jobbers will have to put up with the scarcity till the domestic mills succeed in getting the situation more in hand. Prices are firm, as follows : ½-in black pipe, $2.90; ½-in galvanized, $3.75; 1-in black, $5.60; 1-in galvanized, $7.25.

Soil Pipe—A fair demand exists and supplies are plentiful. Trade in soil pipe is held back more or less by the continuance of the local plumbers' strike and consequently is not as brisk as might be expected for September. Present prices are : Medium and extra heavy pipe and fittings, up to 6-inch, 70 per cent.; 7 and 8-inch pipe, 40 and 5 per cent.; light pipe, 50 per cent.; fittings, 50 and 10 per cent.

Lead Pipe—The price of lead pipe remains firm at 5 per cent. off list.

Solder—A fair demand exists for solder, with wiping still quoted at 23c per pound.

Brass Work—The discounts on brass work are unchanged and business is fairly good. Compression work is quoted at 57½, and fuller work at 65 per cent. off list. Ground work quotations run as follows : Bibbs, 45; roundway, 50; and flatway work, 55 per cent.

Cast Iron Fittings—A good average September business is being done in fittings and the price remains firm and unchanged at 57½ per cent. off list.

Enamelware—There is a good demand and fall trade has opened out well. Jobbers have now gone back to the October price list on enameled baths, which means a decrease of approximately 15 per cent. in the price. On all other classes of enamelware the January price list still holds good.

Metals—There is a steady demand for antimony but no large transactions have taken place during the week. Cookson's is still quoted locally at 15c, and Hallett's at 14½c. In pig iron the increase in business which began last week , is well maintained and additional buyers are in evidence this week. Many consumers who have been playing the waiting game have now come into the market, and more prompt buying is now being done. Lead has been in better demand during the week and local prices are a little stiffer in response to recent advances which have taken place in the British market. The local price of imported pig lead is very firm at $5.35. Copper sales have been rather small during the week, and consumers seem to show a disposition to hang back and watch the market. In old materials prices are still declining and there is little or no life to the local situation, which continues to reflect the dullness of the over-sea market. The price of heavy copper and wire has declined one cent, and is now 14c; light copper and heavy red brass have each declined one cent, and are now 12c. The market for scrap iron continues very dull, though prices locally are unchanged.

MONTREAL.

Montreal, September 9.—On the whole, market conditions at present are quite satisfactory. The supply houses are well satisfied with the amount of business being transacted, and they are very hopeful as to the prospects of the coming season. This year so far has seen a large increase per month over any previous year in the volume of trade. With the exception of brass goods manufacturers all the factories are in a good position to take care of the trade and many of them are taking timely precautions against scarcities during the coming season by endeavoring to replete their reserve stocks.

Iron Pipe—A steady demand prevails. Factories are busy not only with current orders, but also in the endeavor to lay up surplus stock. Prices are firm and unchanged : 1-in black, $5.60; 1-in galvanized, $7.25.

Lead Pipe—A strong demand prevails, and makers are very busy keeping pace with the demand. We quote : Lead pipe, 7c; lead waste, 8c; 5 p.c. off on both.

Brass Goods—A strong demand exists for all lines of brass manufactures. Factories, however, are unable to supply fully the demand owing to delay in procuring raw materials and the great difficulty experienced in securing labor. Owing to the very heavy demand, many of the factories find it absolutely necessary to run, as often as possible, day and night, and night operators are hard to secure. Prices remain firm and unchanged : Standard compression work, per cent. off; fuller work, 70 per cent. off.

Enamelware—A large volume of business is being done and the factories are exceedingly busy endeavoring to cope with the demand. Supplies of raw material are being advanced steadily and the only thing that can possibly limit the output of the factories is their lack of capacity. Prices are still unnecessarily low owing to strong competition.

We continue to quote a discount of 15 per cent. on urinals and closets.

Cast Iron Fittings—Demand is good. Prices are unchanged; discount, 57½ per cent.

Metals—Local metal conditions are characterized generally by dullness and inactivity. The depression of the past month or so still exists. Two or three commodities, however, have strengthened. Copper is firmer at $22. Lead is very strong at $5.75 for bar; pig iron is firm: Middlesboro, No. 1, $21.50; No. 2, $20.50; Summerlee, $25.50. Scrap iron is weak at $17; heavy copper and wire, 15c; light copper, 13½c; heavy red brass, 13c; heavy yellow brass, 10c; light brass, 7c; heavy lead, 4c; scrap zinc, 3¾c; No. 1 wrought iron, $15.50; No. 2, $6.

NEWS OF THE TRADE IN CANADA

The infant child of W. L. Helliwell, manager of the Winnipeg branch of the Gurney Foundry Co., died last week.

The new plant of the Canadian Brass Manufacturing Co., at Galt, is now in operation, and will manufacture plumbing supplies and brass castings.

The contract has been awarded to the Canadian Iron & Foundry Co., Montreal, for 21 hydrants and 140 tons of pipe by the town of St. Mary's, N.B.

The Monterey Plumbing Co., Toronto, has been incorporated with a capital of $50,000. The incorporators include R. Ruel, G. F. Macdonnell and A. J. Mitchell, all of Toronto.

Gingras & Nadeau, plumbers, Levis, Que., have been awarded important contracts for installing heating by hot water at Indian Lorette and St. Alphonse churches, at Thedford Mines.

The firm of W. Mashinter & Co., plumbers, steam and gas fitters, of 90 Adelaide street west, Toronto, assigned last week. This is the only large firm which gave in to the union in the present plumbers' strike in Toronto.

The heating and ventilating contract for the new wing, operating room, and alterations to the General Hospital Orillia, has been awarded to the Orillia Hardware Co., Orillia, Ont., at $1,625. The plumbing contract was awarded to the same firm at $1,025.

The Plumber and Steamfitter has to thank Joseph R. Martin, manufacturers' agent, Montreal, for several photos taken at the recent National M. P. A. convention, an accident having prevented the reproduction of those taken by the representative of this paper.

W. L. Clucas, manager of the W. L. Clucas Plumbing & Heating Co., St. Louis, Mo., spent a few days in Toronto last week. Mr. Clucas reports business good in the building lines through the Southwestern States, especially in the State of Missouri, and particularly in the city of St. Louis.

A number of Fredericton, N.B., capitalists have organized a company to manufacture acetylene gas generators. The new company will be known as the Monitor Manufacturing Co., and will be capitalized at $24,000. John Kilburn, T. B. Kidner, Dr. W. H. Irvine, W. T. Chestnut and J. H. Barry, are among those interested in the venture.

On the report of the city engineer, the Halifax Works Department has recommended the purchase of two thousand half-inch and one hundred three-fourth-inch Trident meters from the Neptune Meter Co., of New York, and nine hundred half-inch Lambert meters. The half-inch Tridents cost $13.26 and the three-quarter-inch Tridents $19.89. The Lambert half-inch cost $11.20 each with connections.

President S. Manche and Vice-President Albert Manche, of the Canadian Brass Manufacturing Company, Galt, were visitors at the Toronto offices of Plumber & Steamfitter a few days ago. The latter and Secretary-Treasurer W. L. Lefavor, Sales Manager D. R. Gannon, Superintendent Harry Leddon and

NEWS PAPER REPRESENTATIVES AT CONVENTION.

Editor Wrigley of the Plumber and Steamfitter (on the left), and Mr. O'Connor of the Plumbers' Trade Journal (on the right).

many of the workmen at the new Galt plant, were formerly connected with the Glauber Brass Company, of Cleveland.

The organization meeting of the shareholders of the Canadian Wolverine Brass Co., Chatham, Ont., was held in that city recently, L. A. Cornelius being elected President and H. C. Cornelius Vice-President, for the ensuing year. Claud Cornelius, nephew of Cornelius Bros., who holds the controlling interests in the company, will be manager and general superintendent of the Chatham concern. The building operations are progressing rapidly.

Amongst the exhibitors at the Toronto Exhibition, in addition to the James Robertson Co., whose display is illustrated on another page were the following: James Morrison Brass Manufacturing Co., Toronto; Borden-Canadian Co., Toronto; Amherst Foundry Co., Amherst, N.S.; Keith & Fitzsimmons Co., Toronto; Rudd Manufacturing Co., Toronto; Archer Light, Heat & Power Co., Toronto; Pease Foundry Co., Toronto, and I. E. Shantz & Co., Berlin, Ont.

CONDENSED OR "WANT" ADVERTISEMENTS.

Advertisements under this heading 2c. a word first insertion; 1c. a word each subsequent insertion.

Contractions count as one word, but five figures (as $1,000) are allowed as one word.

Cash remittances to cover cost **must** accompany all advertisements. **In no case** can this rule be overlooked. Advertisements received without remittance cannot be acknowledged.

Where replies come to our care to be forwarded, five cents must be added to cost to cover postage, etc.

FOR SALE.

FOR SALE—First-class set of tinsmith's tools, second-hand but almost as good as new; includes an 8-foot iron brick, almost new. Apply Pease-Waldon Co., Winnipeg.

HARDWARE, tinware, stove and plumbing business in manufacturing town in the Niagara Peninsula; no competition; $250,000 factory and waterworks will be completed this summer; stock about $3,000; death of owner reason for selling. Box 85, Thorold, Ont.

PLUMBER'S Cabinet for sale, cost $75, stands nine feet high and is 6 feet wide, contains 68 drawers, ranging in size from 3 in. x 3 in. to 6 in. x 18 in. Am installing larger cabinet, otherwise would not think of selling. Box 649, Plumber and Steamfitter, Toronto.

BUSINESS CHANCES.

WANTED—Partner to take half interest in one of the best hardware propositions in Algoma; plumber preferred. Box 636, Plumber and Steamfitter, Toronto.

OFFICE space wanted by manufacturer in Toronto: state location and terms. Box 645, Plumber and Steamfitter, Toronto.

SITUATION VACANT.

WANTED—A salesman familiar with plumbing supplies and gas ranges, to represent a Canadian manufacturer direct to the wholesale and retail trade; must have acquaintance with the trade; best of references will be expected; give full information concerning experience, acquaintance with the trade, salary expected; good position for the right person. Only those who can fill the above qualification need apply. Box 639, Plumber and Steamfitter, Toronto.

THE WANT AD.

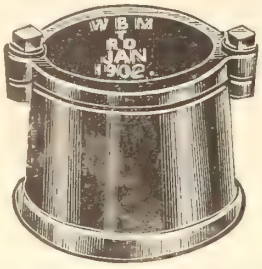
The want ad. has grown from a little used force in business life, into one of the great necessities of the present day.

Business men nowadays turn to the "want ad." as a matter of course for a hundred small services.

The want ad. gets work for workers and workers for work.

It gets clerks for employers and finds employers for clerks. It brings together buyer and seller, and enables them to do business, though they may be thousands of miles apart.

The "want ad." is the great force in the small affairs and incidents of daily life.



Malcolm's Cleaning Screw

The cheapest and best in the market.

A TIME SAVER

The cover can always be removed with ease.

MALCOLM & CO. - Toronto

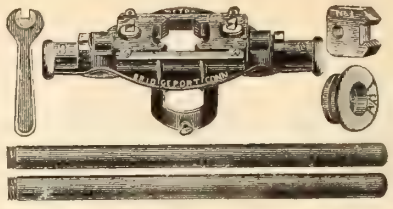
HIGH-GRADE FIXTURES

FOR THE LAVATORY

Ask for Catalog.

Are Manufactured By

The Carriage Mountings Co., Ltd., Toronto



The Armstrong Manufacturing Co.

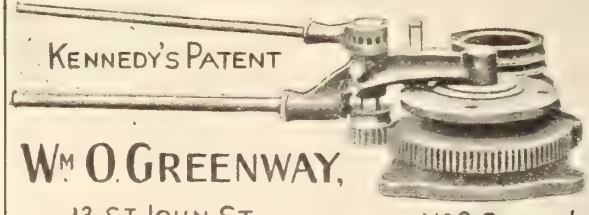
317 Knowlton St., - Bridgeport, Conn.

Manufacturers of the Genuine Armstrong Stock and Die, Malleable Iron Hinged Vises, Pipe Cutters, Pipe Wrenches, Bard Adjustable Bushings, Ratchet Attachment for Stock, Pipe Threading and Cutting-off Machine--Hand and Power. Our goods are sold by all Jobbers.

CATALOGUE MAILED ON REQUEST

THE WORLDS BEST TUBE BENDER

KENNEDY'S PATENT



WM O. GREENWAY,

13. ST JOHN ST.,

MONTREAL.

No 2 Geared

NO HEAT REQUIRED.

apply for List.

If you can use High-grade Low Down Compression Basin Cocks with China Index Handles, ask for the Acme Brass Works Nos. 4, 5, 6 and 7 Basin Cocks, which are just what you want. They are the acme of perfection in style, workmanship and durability.

Write us to-day.
Do not delay for to-morrow.

Acme Brass Works
CLEVELAND, O.

INSTALL THE

ONLY BRASS GOODS

MADE

GUARANTEED 5 YEARS

They make good customers

Glauber Brass Mfg. Co.

CLEVELAND, OHIO, U.S.A.

Let Our Beaver Do Your Work.

You Don't Have to Change Dies.

Cuts 1, 1¼, 1½ and 2" perfect threads, all with one set of chasers

RAPID WORKER

The Hand Stock that Starts Easy and Finishes Easier.

"The New Way."

You Will Find it a Sure-enough Beaver.

Write for our special 10-day trial offer

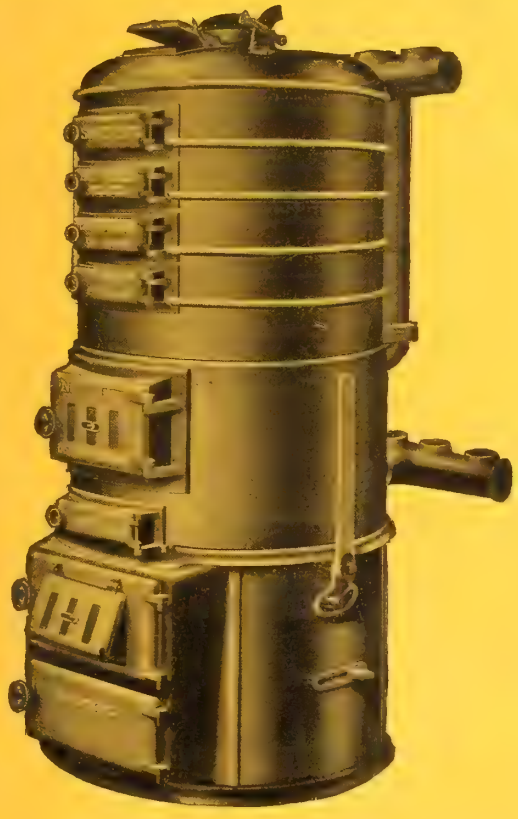
You cannot afford to take the time to thread pipe by hand in any other way

Other sizes of Beavers will be born soon—¼ to ¾—2½ to 4—4½ to 8—8 to 12

Manufactured by

Borden-Canadian Company

166 Adelaide Street West, Toronto



HAVE YOU EVER CONSIDERED

what a difference there is between the

"SOVEREIGN"

Heating System and the other kind? Do you appreciate the

ECONOMY

of the "Sovereign"?

Owing to its improved construction there is practically no fuel waste where a **"Sovereign" Hot Water Boiler** is used. The combustion is pretty nearly perfect, and whatever combustible cinders are left are sifted by a special attachment. Just shake a handle for a moment, then shovel the cinders back into the fire. No dust, no trouble, almost automatic.

There are lots of other distinctive points about the "Sovereign," which you should know. Just send us a post card for "Simplified Heating."

TAYLOR-FORBES CO., Limited

Head Office and Works:—GUELPH, ONT.

TORONTO—1088 King St. W. MONTREAL—122 Craig St.
WINNIPEG—The Vulcan Iron Works, Limited

FREE ADVERTISING CUTS
AND COPY FOR PLUMBERS

Look below at the sample advertisement of **Standard Ideal Porcelain Enameled Ware** and consider if it would help you in your business. We supply plumbers who recognize the merit of **Standard Ideal Porcelain Enameled Ware** with advertising

CUTS AND COPY FREE

If you like the sample on the right, a word from you to us and we will send you what copy and cuts you want, free.

THE STANDARD IDEAL Company,
Limited
PORT HOPE, ONT.

NOWHERE DOES PERFECT WORK COUNT MORE

than in the sanitary equipment of a modern house. Poor plumbing is synonymous with loss of health, loss of comfort, loss of savings, loss in property value.

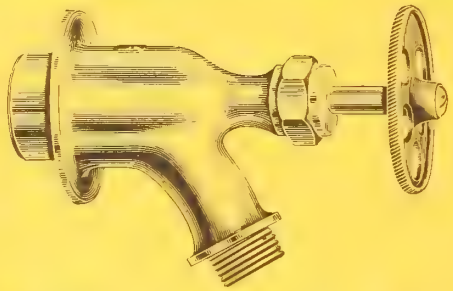
'STANDARD IDEAL' PORCELAIN ENAMELED WARE

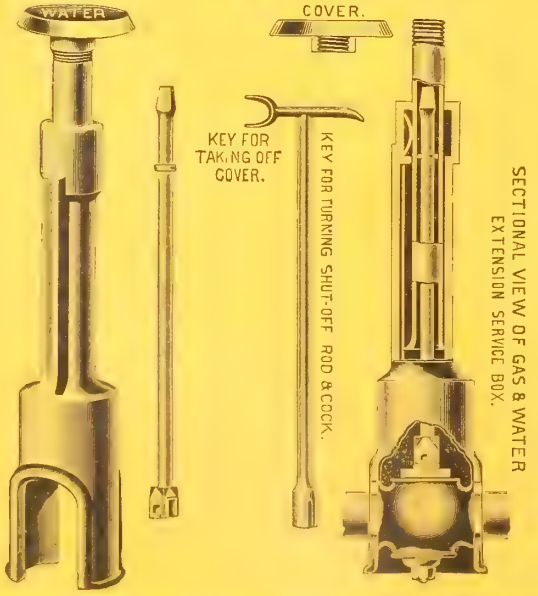
installed in the bedroom, bathroom, kitchen or laundry guarantees health for the family and adds to the cash value of the home.

Moderate in first cost it soon pays for itself and becomes a valuable asset.

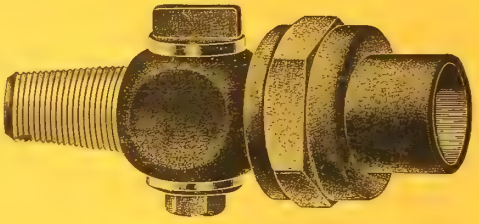
Let us install it in your home.

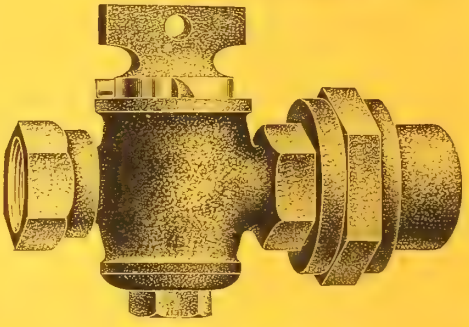
JOHN BLANK & CO.
PLUMBERS and STEAMFITTERS





Fittings That Don't Disappoint





For

Plumbing, Water, Gas and Steam

Hays Manufacturing Co.

Complete Works: - - - ERIE, PA., U.S.A

PLUMBER & STEAMFITTER OF CANADA

THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

MONTREAL, 232 McGill St. TORONTO, 10 Front St. E. WINNIPEG, 511 Union Bank Bldg. LONDON, ENG., 88 Fleet St. E.C.

Vol. I. No. 12. (New Series). Publication Office : 10 Front St. East, TORONTO, SEPT. 25, 1907. Old Series, Vol. XIX. No. 22

THE DAISY BOILER

After a quarter-of-a-century's experience in the manufacture of Hot Water Boilers, the thousands of homes we have supplied and the reputation we have earned, has satisfied us that our product is undeniably the most popular heater in the Dominion. The steamfitter cannot fail to satisfy his most exacting client.

Daisy

SEVERAL STRONG POINTS

It embodies every feature of simplicity, durability and efficiency.

Every part can be set up with ease and despatch.

The draft arrangement permits of the finest degree of control.

Ample room is provided in a spacious ashpit for the convenient handling of ashes.

Write for catalogue and prices.

Your orders for steamfitters' supplies, whether large or small, will receive our best attention. We carry in stock every style and variety of fittings, pipe, valves and miscellaneous supplies.

CLUFF BROTHERS

LOMBARD STREET, TORONTO

SELLING AGENTS FOR WARDEN KING & SON, Limited

Have U Used Our New No. 170½ Low-down Combination ?

This is guaranteed to be the simplest Low-down Combination on the market.

It is operated with a centre push and fitted with high-up ball cock and Douglas rubber float.

There are no levers to get out of order.

The James Robertson Company, Limited

265 King Street West, TORONTO

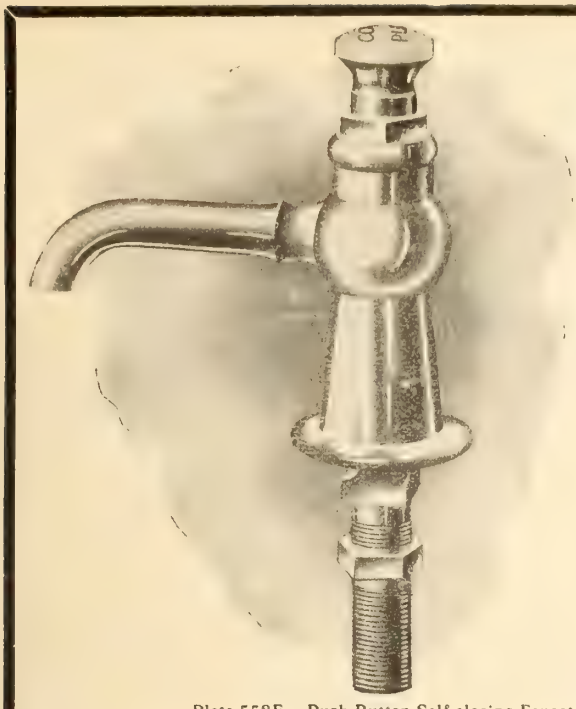


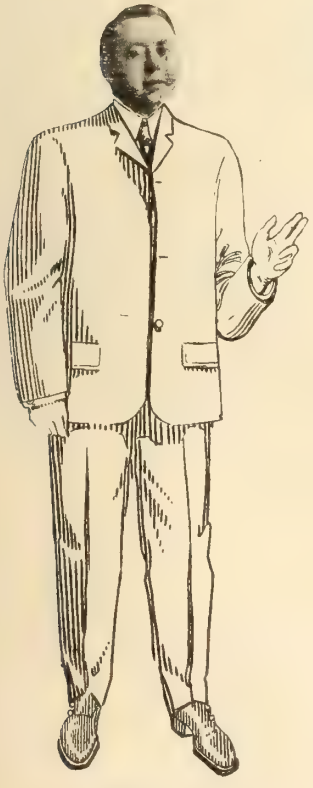
Plate 558E.—Push Button Self-closing Faucet; China Index Top

Plumbers' Brass Work

ALL THE LATEST STYLES PROMPT DELIVERY

SOMERVILLE LIMITED

59 RICHMOND STREET EAST - TORONTO



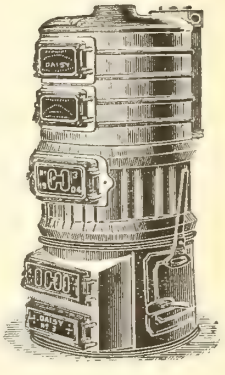
Why You Should Sell The Daisy

¶ *Because the quality of material used in the manufacture of the Daisy is the best procurable.*

¶ *Because every part is accurately finished and thoroughly tested and you are not required to tear down your work to remove defective parts.*

¶ *Because it is the most self-contained and easily erected boiler on the market.*

¶ *Because once the Daisy is properly installed no further time is required to care for it.*



Write for Catalogue.

CLUFF BROTHERS

Lombard Street, TORONTO

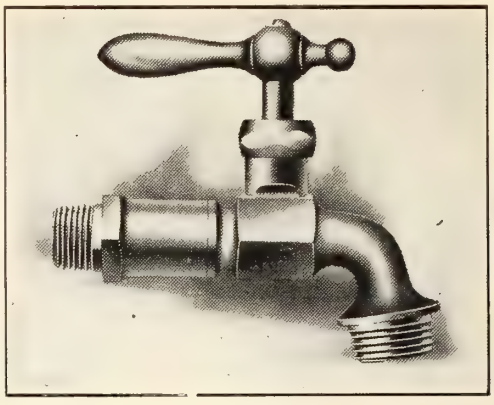
Selling Agents for WARDEN KING & SON, Limited

Monarch is "King."

Have You Noticed

the marked improvement in the

"MONARCH" COCKS?



While we have always aimed to make just a little better than the best kind, our latest surpasses any former effort.

They are the **"Made in Canada"** kind. Lots of first quality metal used in their construction. They are fully tried and tested before shipment.

We are now in a position to give prompt attention to all orders received.

The Monarch Brass Manufacturing Co., Limited

Factory: Port Colborne, - Ont.

Office and Warehouse: 278 Dundas St. - Toronto

MUELLER LINE OF COLONIAL HIGH-GRADE PLUMBING GOODS

To some patrons Plumbing Brass Goods mean nothing more than the bare words signify. They are easily satisfied—a class that say "anything will do." There is another rapidly growing class, however, that see beauty of design, gracefulness of harmonizing curves and richness of finish. This class is not easily satisfied. They are discriminating persons of taste and select goods of

BEAUTY AND ELEGANCE

The Mueller Colonial Line appeals to this class and educates the other to desires for something better than the ordinary.

The Colonial Line of the Mueller Mfg. Co. has not been ruined by over-ornamentation but is strikingly attractive in massive appearance and absence of sharp angles.

WE WERE THE FIRST

to put the Colonial Line on the market and are the only makers of it. The line includes Fuller, Compression and Self-Closing work to meet all requirements of the trade. The proved mechanical principles of Mueller manufacture are used in this line. Unconditionally guaranteed. Write for prices and literature.

TRADE MARK
COLONIAL
REGISTERED

Works and General Offices
DECATUR, ILL.
West Cerro Gordo Street

H. MUELLER MFG. CO.

Eastern Division
NEW YORK CITY
254 Canal St., cor. Lafayette

What Class of Men do You want to Reach?

When you insert a condensed advertisement we presume you want the largest number of responses possible from the best class of people. This cannot result through using only local mediums.

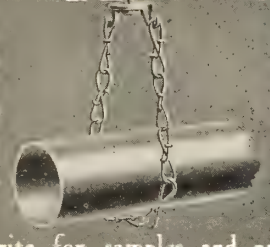
Did you ever stop to think how many Plumbers and Steamfitters read any one of our large dailies? If you have a business for sale or wish to engage a clerk you will not be content to have your advertisement seen by men in any one locality. THE PLUMBER AND STEAMFITTER is not a Montreal, Toronto or Winnipeg paper. It is an ALL CANADIAN NEWSPAPER, and reaches practically all the men engaged in the Plumbing and Steamfitting trades from the Atlantic to the Pacific. Your message will be carried quickly. THE PLUMBER AND STEAMFITTER is mailed the second Wednesday of each month. On Thursday all subscribers in Ontario should receive their copy and by the end of the week your message will have been read by practically every Plumber and Steamfitter from Halifax to Vancouver.

Rates for "condensed ads." : 2c. per word first insertion
1c. " " subsequent insertions.

PLUMBER AND STEAMFITTER

MONTREAL TORONTO WINNIPEG

NIAGARA CHAIN for PIPE HANGING



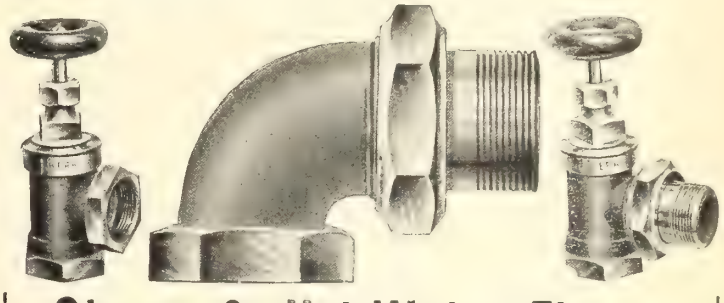
Most convenient and neatest as well as the most economical hanger on the market.

Pipe may be hung any distance from ceiling with this hanger.

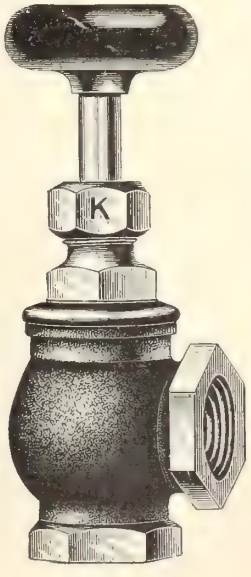
Permits of easy and exact adjustment.

Write for samples and prices.

ONEIDA COMMUNITY, Ltd.
NIAGARA FALLS, ONTARIO.



Steam & Hot Water Fitters



who handle KERR VALVES are the leading men in their line.

You should use Kerr valves for they improve your reputation for high-class work.

Made by a long established and responsible firm.

WRITE FOR CATALOG

THE KERR ENGINE CO.
Valve Manufacturers
LIMITED
WALKERVILLE, ONT.

Backed by a Guarantee

All our **Bronze** Powders and **Liquids** have the distinction of being **Guaranteed.** All plumbers and steamfitters know the necessity of having the **Best** in Bronze Powders and Liquids.

OURS NEVER FAIL

The Canadian Bronze Powder Works
MONTREAL—TORONTO
No order too large Works at Valleyfield

If your nearest dealer does not keep our goods, write us.

Plumbing and Heating Problems

In this department Canadian plumbers and fitters are invited to contribute questions to be answered or criticisms of any technical articles published in the paper. A frank and friendly discussion of trade problems should be helpful to the trade.

THE INTERCEPTING TRAP AGAIN.

In The Plumber and Steamfitter of August 28, an article appeared outlining the views of J. E. Dore, Montreal, in condemnation of the intercepting trap, which opens up a question of vital importance to householders, "Should the owners of real estate submit to the omission of the intercepting trap, and ventilate the public sewers through their private house soil pipe, in the interest of public welfare?"

I feel constrained to speak in the interest of these people and not as a plumber with over twenty-five years' experience, and would say that the only difficulty I have experienced with the trap is that when the fresh air inlet is not properly arranged, and a small dribble continuously runs down the soil pipe, in the cold season this small stream will freeze until it fills the pipe solid. This, however, can be obviated by properly installing the fresh air inlet.

I recollect reading several articles in the English Plumber and Decorator, some years ago, when this question was thoroughly discussed by the leading sanitary experts at that time, the consensus of opinion being that the municipal authorities should take care of the sewer ventilation by constructing proper ventilating shafts, or using, where practicable, high chimneys. A case in favor of the trap was illustrated by the fact that a row of dwellings had the trap omitted, and it happened that a contagious disease occurred in one dwelling, and this was communicated to another through a defect discovered in the soil pipe.

I consider that the escape of sewer air through openings placed in the street, where it mixes with a large quantity of pure air, is far preferable and less injurious than the escape of sewer air from the top of the soil pipe of a low building into the windows of a higher one, which can often occur in a city.

The other objections to the trap such as the escape of foul air after the discharge of fixture, back draft, retention of sewage in trap, escape of sewer air through the ground into dwellings, etc., are subjects that can be treated later.

I merely pen these few lines in order that the plumbers interested in domestic sanitation, will take the matter up so that a profitable discussion through the medium of your journal may produce arguments sufficiently strong to settle the question of the intercepting trap. Trusting that others will spare the time to discuss the matter,

"HYDROSTATIC."

Halifax, N.S., Sept. 9.

ONE-PIPE STEAM HEATING.

The plan of steam heating shown in the August 28th and September 11th issues of The Plumber and Steamfitter is unusual and unique in more ways than one.

Though it may operate under present conditions (which, unfortunately, are not given by the writer) it must be said that it surely has nothing that should recommend itself to an adoption in general practice. Its inception must have laid in some experiment or accident of an unexplainable nature.

As the entire water of condensation must return through the main at B, which is supposed also to act as one of the flows, it would seem that it would have been well to have carried the idea a little further and to have pitched both lines back toward the boiler, so that both lines could act as flow and return mains, thus dividing the condensation between the two sides, instead of returning it all through the one, thus relieving the side, B, from part of its work as a return.

The amount of radiation on each side is not given, but presuming that it is fairly evenly divided between the two sides, it can easily be seen that the steam entering through B must meet with a great deal more resistance than that through A, as the steam and water on the side, B, would be traveling in opposite directions. In the event of the pressure being allowed to run up to 10 or 15 pounds, there would then be every likelihood of the water not properly returning.

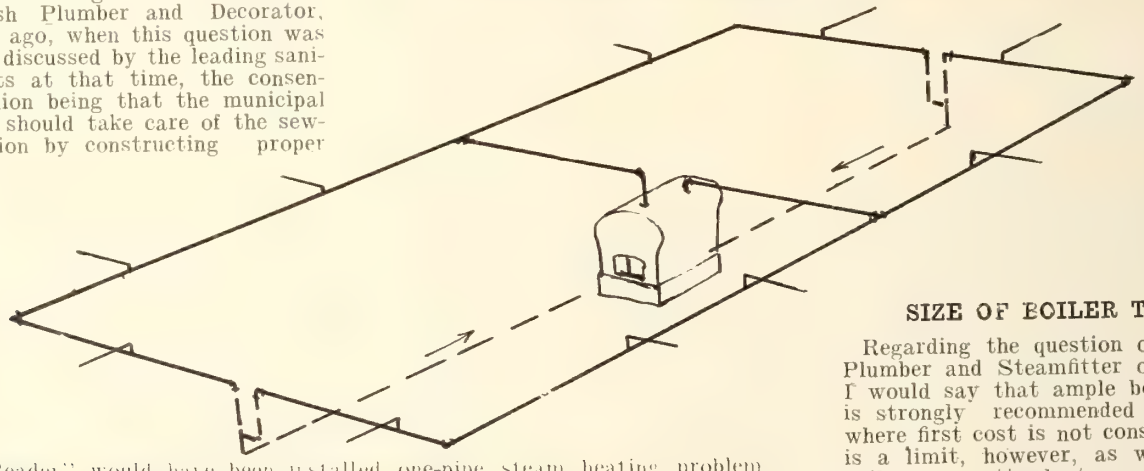
With 3,500 square feet of radiation in the plant, there would be about 100 gallons of water to return an hour through B, so it can be seen that there would be considerable resistance to the flow of the steam through this side.

Assuming that the branches lead to points near the run of the mains, a much preferrable arrangement of the piping would be similar to the sketch shown herewith. By this means the steam and water of condensation would be kept moving in the same direction in the mains. Various modifications of this arrangement of the mains would suggest themselves to the fitter, according to the necessities of the case, and obstacles to be overcome in the running of the pipes.

In the plan shown in your issue of Sept. 11, the steam in the side fed by B would need part with a portion of its heat to the water of condensation returning through this side, so that the evenness of the distribution of the steam would very likely be interfered with in most cases.

"READER."

Hamilton, Sept. 20.



How "Reader" would have been installed one-pipe steam heating problem

SIZE OF BOILER TO USE.

Regarding the question of J.E.W., in Plumber and Steamfitter of August 24, I would say that ample boiler capacity is strongly recommended in all cases where first cost is not considered. There is a limit, however, as with a No. 5 boiler, one attendant would boil the water, while another would regulate the drafts to make the larger boiler more economical than the smaller one, and run for hours without attention. If the radiators were of a capacity to heat the house with the water at an average temperature of say 150 degrees, with a fair fire in a large boiler, when the thermometer registered zero outside, and the coldest weather would not be lower than 15 below zero, I consider there would be no necessity to increase the radiation.

"HYDROSTATIC."

Halifax, Spt. 9.

STEAM PIPES TOO SMALL.

Regarding the steampipe question in your last issue, I would say that the mains are entirely too small, and assuming that the steam pressure is about five pounds, I think that a 7-inch pipe, with the returns entirely below the water line, would give good results.

"HYDROSTATIC."

Halifax, Spt. 9.

RELATIONS BETWEEN MASTER AND JOURNEYMAN

John Troland discusses the changes which have taken place in recent years—Interesting address before the Connecticut Master Plumbers' Association.

The things that hurt our profession furnish themes neither few nor unimportant for consideration, and are on the increase rather than otherwise. With all the marked advance in our art, in the way of appliances and labor saving, it must be said that the difficulty of conducting a profitable business in our line is lessening with each year. While labor-saving contrivances flood the market it is doubtful if the Patent Office contains one model of a worry-saving machine. Such an invention would be a greater boon to us than a "folding boiler stand," or a "noiseless ball cock." The planning and executing of work is a care that falls lightly on the master plumber, compared with that grind between the upper and nether millstones—contractors who want work done for a pittance and owners who are dissatisfied with even more than their money's worth. This is what knocks all the romance, pleasure and poetry out of the profession, and reduces the installation of sanitary systems that should delight the giver and receiver to the bantering level of an ordinary jockeying horse trade. Not long ago a business man said to the writer, "I have been in business 35 years, and withal I am using all modern appliances it is just four times as hard to do business as it was at the beginning." Many of us who have been years in business can assent to this statement.

Relations Have Changed Greatly.

The question of labor is now, and is destined to be, a continual disturber of our peace. Forbid it that any of us would wrong the laborer or deny him the fruits of his toil. Most of us have been laborers of the long-day age, and know that "the laborer is worthy of his hire." The toil and besetments of the journeyman's task are no hidden secret of which we have no knowledge or take no cognizance. We need not to be reminded of these things to stimulate us to justice and fair dealing with our employes, but, like other things, the relation between employer and journeyman has greatly changed since the time when we were journeymen. In those days the hours of labor were reckoned 10 for each day, and the quitting hour was often run over a few minutes than otherwise. There was then no labor union, nor master plumbers' association, with distinct and separate interests to conserve. The workman's interests and the employer's were then more fully merged in one. The employer himself more frequently was the hardest worker of the two, and years of shoulder to shoulder contact made the success of each identical. In a juster sense the journeyman recognized the larger investment and greater responsibility of the master, and for this reason accorded him the conditional respect felt to be his due. If the journeyman had aspiration, it was that he might one day assume the place of the boss, and if he was a frugal and temperate man his savings from the wages he received were such as to make him hopeful of attaining that ambitious end.

In this we are describing how the majority of us became master plumbers. Very few of us started on a legacy from a rich uncle or distant relative. Our first start was from the ways and means just outlined. But to-day all this has changed. The relation between employing plumber and workman is changed. The status of the master is not recognized as of yore. The hours of labor have been reduced to eight, or less, as the occasion may offer, although the hours of business and care for the boss are still the same old 24 hours that they were of old. Although the employer may yet have the ability to take the tools and his place on the floor or at the bench he cannot well do so to-day. The journeyman's union might forbid it or it might seem undignified and disrespectful in the eyes of his modern customers if he did so. He must rely on others now entirely for the execution of his plans, and is beyond the reach of self-help.

Master's Position Not Attractive.

The aspirations of the journeyman no longer seek their ultimate in being "the boss." The greater risk and larger investment in the undertaking of business does not appeal to the workman's sympathies, and are no longer considerations in the employer's favor. The master plumber is regarded by the workman and by the public as "an austere man, taking up where he has not laid down and reaping where he has not sown." The advantages that formerly attached to the master's position as an attractive goal no longer stimulate the ambitious journeyman, for in reality the advantages no longer exist. The strike can shorten the hours of service, lessen the responsibility and increase the daily wage by a shorter and less laborious route than the old beaten path of patient, faithful service. And no matter how great the demand or how unreasonable it may seem to the employer, the workman well knows that in the end it must be acceded to. But what one of you who is an employer can by taking thought add $100 to his annual profit? Yet it is no uncommon thing for the workman to strike for a 50-cent daily raise and get it, and this means more than $150 increase of yearly salary, and equals a bank deposit of $3,750 at 4 per cent. per annum. You can see that this is a more rapid method of increase than any within the power of ordinary business arm's length to reach.

Again, if we could calculate on any possible limit to the demands of labor we might, perhaps, be able to adjust ourselves to it, but in this there appears to be no known terminus. What is called a fair day's work for a fair day's wage for this year will be far too long on the one hand, and too small on the other for the coming year. The 60-hour week that has shrunk to 48 since our time shows all the symptoms of shrinking to 40, or even less within our day, and so on, ad infinitum. Considerations like these make the master plumber's business a less shining mark year by year, and fill the thoughtful mind with dark forebodings.

Hallucinations of Millions.

It may be said that the large number engaged in the business now above former years disproves the extra hazards herein outlined, but in reply, we say that much of this increase in our number is due to the old hallucination of the millions that the business was supposed to yield in the years past. That something like this attracts the unwary ones is proved by the record that is given in the failure columns of our trade papers. Many of those venturing on this sea, whose wavelets once cast up treasures of golden sand, have left their empty, dismantled hulks on the beach a total wreck.

Conventions like this afford us opportunity to talk over these matters and compare notes, but give us no instrumentality for bettering or changing them. We cannot legislate these barriers out of the way. We are but the helpless tools of others on every side. The dealers make us prices for the material we use. The workman names his time and his price for installing the goods, and when the job is completed, if not before it is commenced, the contractor or owner steps up and tells us just what he will allow us for the completed job. We alone have the privilege to figure up the profit and loss, see that the work is perfect and guaranteed and remains so, wear all the honors, and the diamond pins and yield our backs to the kicks of the kicker.

KING RADIATORS SOON.

Work on the new King Radiator Company's plant, on St. Helens avenue, Toronto, is nearing completion, and it is expected that the metal will be running and castings made in another two weeks, with the company ready to ship orders before the end of October.

Cluff Brothers have a large amount of business booked for early shipment, and the plant will be kept running to its fullest capacity from the outset.

PIPE JOINT MIXTURE.

For ordinary pipe joints use a mixture of plumbago and vaseline, instead of white lead. This mixture does not dry out and the joint is easily separated when needed.

PLUMBER AND STEAMFITTER OF CANADA

The MacLean Publishing Co.
Limited

JOHN BAYNE MacLEAN - - - President
W. L. EDMONDS - - - - Vice-President
H. T. HUNTER - - - - Business Manager
WESTON WRIGLEY - - - Managing Editor

Publishers of Trade Newspapers which circulate in the Provinces of British Columbia Alberta, Saskatchewan, Manitoba, Ontario Quebec Nova Scotia, New Brunswick, P. E. Island and Newfoundland.

OFFICES:

MONTREAL - - - - - 232 McGill Street
Telephone Main 1525
TORONTO - - - - - 10 Front Street East
Telephones Main 2701 and 2702
WINNIPEG - - - 511 Union Bank Building
Telephone 3726
LONDON, ENG. - - - - 88 Fleet Street, E.C.
J. Meredith McKim
Telephone, Central 12960

BRANCHES:

CHICAGO, ILL. - - - - - 1001 Teutonic Bldg.
J. Roland Kay
PARIS, FRANCE - Agence Havas, 8 Place de la Bourse
MANCHESTER, ENG. - - - 92 Market Street
ZURICH, SWITRERLAND - - - Louis Wolf
Orell Fussli & Co.

Subscription, Canada and United States, $1 00
Published Twice Every Month

OFFICERS OF NATIONAL MASTER PLUMBERS' ASSOCIATION.

Past President—F. G. Johnson, Ottawa.
President—John Watson, Montreal.
Vice-President—Joseph Laurier, Montreal.
Secretary—H. A. Knox, Ottawa.
Treasurer—Harry Mahoney, Guelph.

Provincial Vice-Presidents—
Ontario—Charles Taylor, Brantford.
Quebec—J. E. Walsh, Montreal.
Nova Scotia—F. Dexter, Truro.
New Brunswick—H. Dryden, Sussex.
Manitoba—A. J. Hammond, Winnipeg.
Alberta and Saskatchewan — E. J. Young, Calgary.
British Columbia—Bert Weeks, Vancouver.

Chairmen of Committees—
Legislation—H. J. Chandler, Ottawa.
Apprenticeship—J. A. Thibeault, Montreal.
Sanitary—L. Legrow, Toronto.
Essay—G. A. Wootten, Halifax.
Organization—H. McCauley, Montreal.

RURAL SANITATION.

In response to a special request, the article on sewerage systems for rural districts, by M. J. Quinn, is re-published, it being the best contribution to this subject before the plumbing trade in Canada. In Northern Ontario and in many places in Western Canada, great activity is being manifested in the installation of modern sewerage systems in towns, as well as in connection with plumbing outfits in rural homes.

* * *

The "Sanitary Journal," published quarterly by the Provincial Board of Health of Ontario, in its last issue, devotes the bulk of its space to the improvement of the water supplies and sewerage systems for many Ontario towns and cities, notably: Peterboro, Picton, Cobalt, New Liskeard, Bracebridge, Chesley, Bradford, Port Elgin, Gravenhurst, Chapleau and Haileybury.

At the last session of the Ontario Legislature a clause was added to the Public Health Act, giving the Provincial Board power to enforce certain regulations upon municipalities not enjoying modern sewage and water systems. The clause, which stands as subsection 6 of section 30 of the Public Health Act, reads as follows:

(6) No sewage; drainage, domestic or factory refuse, excremental or other polluting matter of any kind whatsoever, which, either by itself or in connection with other matters corrupts or impairs, or may corrupt or impair, the quality of the water of any source of public water supply for domestic use in any city, town, incorporated village or other municipality, or which renders or may render such water injurious to health, shall be placed in or discharged into the waters, or placed or deposited upon the ice of any such source of water supply, near the place from which any municipality shall or may obtain its supply of water for domestic use, nor shall any such sewage, drainage, domestic or factory waste or refuse, excremental or other polluting matter be placed or suffer to remain upon the bank or shore of any such source of water supply near the place from which such municipality shall or may obtain its supply of water for domestic use as aforesaid, nor within such distance thereof as may be considered unsafe by the Provincial Board of Health, after an examination thereof by a member or officer of the said Board, and any person who shall offend against any provision of this section, shall upon summary conviction be liable to a penalty of not more than $100 for each offence, and each week's continuance after notice by the Provincial Board of Health or local Board of Health to abate or remove the same, shall constitute a separate offence.

* * *

The first application under this amendment was from Peterboro, the board examining the water supply of that city and making many recommendations towards its improvement. In one case it was found that one hundred sawmill employes were using open closets over the river from which the city water supply was taken. This, along with other similar corrupting influences, was ordered to be discontinued.

* * *

In an address before the Ohio State Board of Health, President Josiah Hartzell referred to the comparatively simple sanitary problems in country districts as follows:

"In large cities the immediate and urgent instinct of self-preservation has compelled the intervention of skilled engineers; the establishment of most approved methods. Most acute conditions are often found in towns and villages. For example, in the case of applications for sewers reaching the State Board from such communities, the majority already have in use crude, poorly constructed drains, carrying domestic sewage this way and that, in quest of the nearest watercourse. The abolition of these temporary expedients and the establishment of safe sewers, mixed up as these are with financial troubles, often constitute problems of the most vexatious character.

"Mankind for centuries past has recognized and still recognizes instinctively the powerful agency of the atmosphere and soil in dispelling and absorbing filth. The recognition is so universal that the act of casting the wastes of humanity to the winds and to the earth in the most heedless and haphazard way has become second nature. When the country people group together in villages the careless habit remains, and it is only when the dire results of an over-application of filth to the ground menaces the public health that competent advice is sought.

"As a result of all the study and experimentation of the past century in the field of sanitation, it may be said that these problems, complex as they may appear to be, are usually resolved by just giving the elements of nature a fair chance, instead of hampering their operation. How slow has been our progress in getting back to nature; in learning that even tuberculosis, the dread scourge of civilized man that has persistently mocked at all the empiricisms and puerilities of man, could be constrained to bow its horrid face only in the presence of Nature's pure air!"

BAMBOO WATER PIPES.

The Japanese of British Columbia have recently begun the cultivation of bamboo on a large scale. The experiment is proving quite successful. Bamboo roots are being brought in large quantities from Japan and transplanted in British soil.

The cultivation of bamboo is very profitable in Japan, the returns varying from $20 to $90 per acre. With a successful cultivation of the plant in British Columbia, the Japanese hope to work up a big trade in bamboo furniture. Willow is the best that can be secured in this country, but bamboo is far superior to the willow that is now used.

Another industry which the Japanese will endeavor to work up will be the use of bamboo for water pipes. In Japan bamboo is largely used as water pipes, and the growers see no reason why it could not be used in this country.

JOURNEYMEN GAIN A POINT.

The Toronto plumbers' strike has been running along with little incident for over four months, the men winning over many of the smaller firms at the beginning of the struggle last May, and the bosses since then presenting an unbroken front until ten days ago, when three firms, Messrs. Robert Ross, Queen street west; James Elliott, College street, and Frank Wallis, Yonge street, employing in all about 30 men, broke their bonds with the employers and took on union men at the union terms.

In order to save their $1,000 bond, however, it is understood that no agreement has been signed with the men, although it is a fine point of law as to whether this will prevent the bond company from paying the bond money into the Master Plumbers' Association and collecting upon the security given by the three firms who entered into the bond.

The winning over of these three men is undoubtedly a gain for the unionists, and comes at a time when it was generally felt that the union men had lost the strike and were willing to give in on any terms which would have a semblance of give and take. The incident, therefore, is likely to give renewed spirit to the men and prolong the strike. The great body of employers are undoubtedly as determined as ever not to accept the union's wage terms, and grant the "closed" shop, and the practical stoppage of building in Toronto, due to seven per cent. loan money, is a decided help to the bosses in their position.

* * *

An interesting point in connection with the strike is the explanation given by Toronto master plumbers as to why no delegates from this city attended the recent national convention at Montreal. The reason is that the bosses felt that if they left their shops for several days the union pickets would steal away all their journeymen. Consequently, the masters stayed on the job and let the convention go.

* * *

The case against Fred. Armstrong, Toronto, for bringing in journeymen from Philadelphia, contrary to the Alien Labor Law, had not been decided at the time of going to press.

BE CAREFUL WITH NAMES.

A reader of this paper draws attention to the carelessness with which many business houses handle firm names. For some weeks the reader has been watching his mail and has been surprised at the number of times his name has been mis-spelled. The evil, he says, is far greater amongst his Canadian correspondents than amongst writers in the United States, more attention being paid to the proper spelling of firm names across the line.

Jobbing houses are, he says, amongst the greatest offenders, one house with which he has been dealing for over 30 years persisting in spelling his name "Johnston," although all his printed matter reads "Johnson." "If I signed my cheques and drafts as carelessly as these business houses write their addresses," writes our correspondent, "it would be necessary for them to hunt around for some one who would pay the accounts."

The points are well taken. It is undoubtedly annoying to receive nine out of ten letters with the address wrongly spelled. Many of the errors are made, probably, in dictating letters to stenographers, but the instance given by the correspondent of a firm continuing to address a customer wrongly after a thirty years' business connection shows gross carelessness, as hundreds of letters must have been received containing letterheads, etc., on which the customer's name was correctly spelled.

Most men are particular about the spelling of their names and all merchants and employes of business houses should take particular care to make no mistake when addressing customers in correspondence or in personal conversa-

SEASON FOR SMOKE TESTS.

This is the time when the inhabitants of large cities have in a large part made their return from summer outings and when they discover that repairs are needed in their homes. The plumber will miss much profitable business, suggests the Metal Worker, if he neglects to send around cards announcing that he is prepared to make a test of the plumbing system to show whether or not it is prepared to conduct away safely the household wastes. He can point out that it is not uncommon that the settling of a building or shocks transmitted from the erection of other large buildings or heavy traffic will crack some of the more brittle parts of a plumbing system and make an opening through which direct connection with the sewer is made.

It is a comparatively simple matter to make a smoke test and on assuring the family that it is not necessary for any change in its regular habits, he is likely to be employed to discover the condition of the plumbing outfit. Even if he finds that there are no repairs needed for the drainage pipes, he will frequently find the need of replacing washers, packing the stems of compression work and much other similar simple service, which, if done without interfering with the family and without causing any annoyance, will build up for him a reputation well worth having. For this work some of the modern smoke test machines which generate a very searching and pungent odor from the use of chemicals, and which permit the use in connection with the smoke of peppermint or ether, have been found admirably adapted.

Dull trade can be driven away from many shops by the proper use of neat advertising matter and the drainage testing apparatus in the hands of an intelligent and enterprising man of affairs.

THINGS TO FORGET.

If you see a tall fellow ahead of a crowd,
A leader of men, marching fearless and proud,
And you know of a tale whose mere telling aloud
Would cause his proud head to in anguish be bowed,
It's a pretty good plan to forget it.

If you know of a skeleton hidden away
In a closet, and guarded, and kept from the day
In the dark, and whose showing, whose sudden display,
Would cause grief and sorrow and lifelong dismay,
It's a pretty good plan to forget it.

If you know of a thing that will darken the joy
Of a man or a woman, a girl or a boy,
That will wipe out a smile, or the least way annoy
A fellow, or cause any gladness to cloy,
It's a pretty good plan to forget it.

—Common-Sense.

FARMERS TAKE TO PLUMBING.

E. A. Latimer, manager of the plumbing department of the Orillia Hardware Company's business, was a visitor in Toronto last Saturday. Mr. Latimer says that of 36 plumbing outfits contracted for this season, three have already been installed in farm houses, and four more are yet to be completed for farmers. Up to this season, none of this work had been done in the rural section near Orillia.

The Orillia Hardware Company has in hand a nice contract for a $3,000 plumbing and heating job on the new Orillia hospital, besides a $1,000 job on a new residence for T. H. Sheppard.

"CHARLEY" WORLD'S CHANGE.

Charley World, for many years with the James Morrison Brass Manufacturing Company, Toronto, has accepted a position with Somerville, Limited, and will introduce the new "Somerville" brass goods to the trade as soon as the new plant is producing goods.

In another month the machinery will be installed and put in motion, and by December a line of high-class brass goods will be offered the trade and prompt shipments made.

Sewerage System for Rural Homes, Schools and Factories

By M. J. Quinn in Hardware and Metal, and reproduced in Plumber and Steamfitter by request.

It is, perhaps, no exaggeration to say that, having regard to the frequency with which it comes up for consideration, and many other circumstances, the question of properly disposing of sewage is one of the most important matters with which the health authorities throughout the country have to deal, and yet it is a remarkable fact that in these days of popular education when the people enjoy the benefit of free literature and lectures on fruit growing, dairying, domestic science, etc., that a knowledge of so important a subject, and one so closely allied to their physical and moral welfare is confined to a limited number.

True, a vast amount of experimenting has been done during recent years, and the matter has received a great deal of attention from scientific men, the results of whose labors have been freely discussed at medical conventions and reported in medical journals, but the valuable information so obtained has not reached the great mass of the people at all.

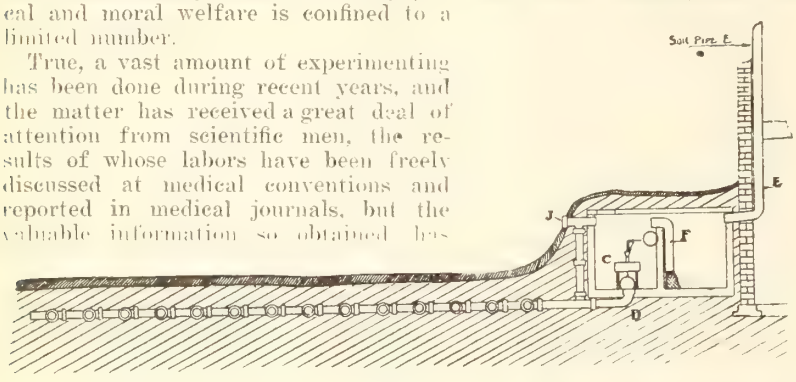


Fig. 1

In the matter of public sanitation, the question of disposing of sewage in small towns and villages, as well as in less populated districts, where by reason of its great cost a general system of sewerage is impossible, is daily becoming of greater importance, and as the title of my paper would indicate, that is the phase of the question with which I propose to deal. The system to which I intend to refer is known as the septic tank system, and I believe that nearly all who have studied it are agreed that it is at once the most natural, most scientific simple and economical system in use to-day, and, speaking from a personal knowledge of scores of the systems, I am in a position to say that it is worthy of all the good thinks that are said of it.

I realize, that, apart from a description from a mechanical standpoint, anything I might say to medical men regarding the system would be superfluous, but for the benefit of the laymen who may be in need of information on the subject, and in order to emphasize the necessity of carrying out every detail, in constructing a system as hereafter described, I deem it wise to briefly refer to the fundamental principles which govern it.

It is a matter of common knowledge that living earth—or top soil—is a powerful purifying agent, but comparatively few are aware that the presence in it of countless numbers of bacteria, or microbes, is alone responsible for the chemical changes brought about in waste matter placed beneath its surface, and that these bacteria, not only through their action remove and destroy the dangerous properties of such waste matter, but actually convert them into plant food, which being taken up by the vegetation, is again consumed for the sustenance of life. Pasteur divided these microbes into two classes, viz.: anerobes, or those which lived apart from air, or derived their oxygen from decaying compounds, and aerobes, or those which require plenty of fresh air for their development, and as both

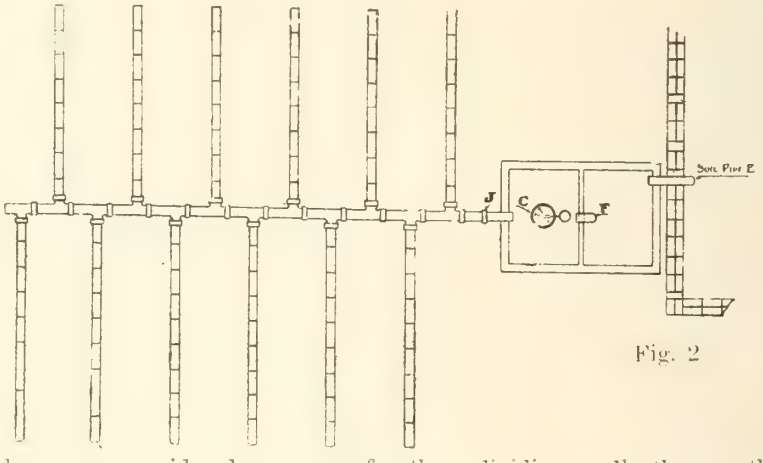


Fig. 2

classes are considered necessary for the complete reduction of waste matter, it will be seen that if sewage is placed too deep in the earth, as, for instance, in a cesspool, where, owing to the absence of air, the necessary aerobic bacteria cannot exist; it may pass down deeper in a putrid state, and, finding its way in the water supply, not unfrequently results in an outbreak of typhoid fever or some intestinal disease.

The two classes of microbes referred to have properties somewhat differing from each other, but the net result of their work under proper conditions is the breaking down of the solid matter in the sewage, the disintegrating of its constituents and the conversion of the whole into liquids and gases, in which form it leaves the septic tank, the former to be distributed under the surface of the earth, where, by reason of its contact with free oxygen, bacterial life is most active, there to be still further reduced and finally converted into nitrates, which are readily taken up by the vegetation on the surface, and the latter passing up high into the air, as hereafter described.

With this brief reference then, to the principles which underlie what is conceded to be a most efficient system for the disposal of sewage, I propose to indicate how it should be constructed; and in order that I may the more readily make myself plain, I have drawn for your inspection a number of diagrams which I trust will accomplish the desired result.

In Fig. 1 is shown an elevation of a complete system built on level ground, with the tank placed close to the wall of the building—where, in fact, the large majority of those now in use are located.

The tank should be built of brick or stone, laid in and lined with cement, or of solid concrete, the main object being to have it impervious to moisture.

It will be noticed that the tank is divided into two compartments, an overflow pipe "F" being built into the dividing wall, the mouth of the said overflow being within seven or eight inches of the bottom of the tank, and being covered with a wire screen about the size of an ordinary pail, the mesh of said screen not exceeding three-quarters of an inch.

The main soil pipe is represented by "E" and should be directly connected with the closet, bath, sink, etc. It extends from the same compartment in which the overflow is placed to a point two or three feet above the roof, said pipe acting not only as a conductor of sewage to the tank but also as a channel by which any gases in excess of those in solution may pass out to the atmosphere at a height which renders it impossible for them to inconvenience the occupants of the building.

"J," in the second compartment, admits fresh air, which passes freely over the centre partition—spaces being left in the top of the latter for the pur-

pose—and up through the soil pipe to the roof.

In the centre of the second compartment is placed an automatic valve "C," the said valve is caulked into a four-inch cast iron bend, as ordinarily used by plumbers, and which is securely built into the bottom of the tank during its construction. The top of the hub of the bend is usually left slightly lower than the level of the floor of the tank.

From the said iron bend is run a line of glazed tile pipe, four inches in diameter, having a connection with the fresh air pipe, for the purpose of ventilation, and a number of openings placed at intervals of two feet or more from which are run branches of four-inch field tile with loosely butted joints.

Fig. 2 shows a plan of the whole system and illustrates one way in which the tile may be laid, though, as will be manifest, they would do equally well if all laid in one side of the main carrier in any number of branches, of any length, providing a sufficient number in the aggregate are laid, and the rows are not placed closer together than two feet in light soil, and a somewhat greater distance in heavy soil

The field tile should not be placed more than one foot below the surface and must be perfectly level, for the reason that if given a fall the earth surrounding the low ends of the system would receive more than its share of liquid sewage, and might in time become fouled. While if level, the earth surrounding every tile has an equal amount of work to do, and will produce most satisfactory results.

Briefly, then, the operation of the system is as follows:

The sewage from the building enters through soil pipe "E," filling the first compartment in which all solid matter is retained until it is reduced by the contained bacteria which multiply and develop very rapidly. In a liquid form it is allowed to enter the second compartment through over flow "F" which is turned down because of the presence of the bulk of the organic matter in suspension on or near the surface.

When the liquid has risen in the second compartment to the height at which the unlocking float on the valve has been set, the valve automatically opens, and discharges the contents of that compartment, be it fifty or a thousand gallons, into the system of field tiles, through which it percolates into the surrounding earth, to be taken care of by nature as has already been described.

As the tank takes from twelve to twenty-four hours to fill, it will be obvious that there will be abundance of time in which the water in the tiles may soak away before it again discharges.

To prevent the gases of decomposition escaping through other than the proper channel the tank must be covered first with rough plank, and then with five or six inches of earth, which, in turn, if desired, may be sodded over.

In figuring out the size of tank necessary, the following may be taken as a safe rule, viz.: for every occupant of a private house or hotel, allow three cubic feet of space in each compartment, while for a school or factory, where, as in the case of a house, nothing but domestic sewage is to be treated, one-third less space will be sufficient, and for every cubic foot in one compartment (or one-half the tank lay) thirteen feet of four-inch field tile.

It will be obvious that, as in the case of ordinary stable manure: human excreta, if deposited in its solid state just below the surface of the earth, would entirely disappear in a very short time, and the system just described is merely a most convenient and sanitary way of automactically accomplishing that very desirable result, with the accompanying advantage of not only depositing it in the earth partially treated, but in a much more favorable condition to receive final treatment than could possibly obtain if the former method were adopted.

Anticipating the difficulty which will be encountered where there is a considerable fall in the ground surrounding the building to be drained, I would refer you to Fig. 3, which shows a number of terraces each receiving a portion of the effluent from the tank.

It will be noticed that the end of the glazed tile is turned up a few inches on the brow of each terrace, the obvious result of which is that all the field tiles at that level must fill before the sewage can rise and overflow to the tiles on the next lower level, where the same operation takes place, and so on for any number of terraces, and as will be apparent, the sewage passing into the tiles on a high level cannot possibly escape to those lower down, so that the earth surrounding every tile, will have its full complement of work to perform.

Fig. 4, the horizontal scale of which is somewhat exaggerated, shows the proper relative position of the tank to the house where the field tiles have to be placed on a level considerably below that on which the building stands. In such a case it will be evident that were the tank placed on the high level, the discharge would come down with sufficient velocity to wash out both earth and tiles, while the discharge from the house to the tank as shown will not have any injurious effect on the latter.

In answer to a question which arises in the minds of most people who have given consideration to the system, I may say that it will not freeze in winter, even when the frost penetrates the ground for several feet everywhere, except where the tiles are laid, and, as may be expected, splendid results may be obtained in vegetables or flowers if the tiles are laid under a garden

In conclusion, I would simply refer to a few of the principal points which should be kept in mind in constructing such a system, viz.:

Have the tank covered with a few inches of earth, to prevent the escape of gases, except through the soil pipe stack. See that the valve discharges at least once before the tank is covered in. See that no trap is placed on the main soil pipe to prevent the free passage of air across the tank and up to the roof. and that the necessary space for the air is left in the top of the centre partition, and, finally, take care that no disinfectants or chemicals of any kind are allowed to enter the tank, if the life of the bacteria, upon which the system depends for its success, is to be preserved.

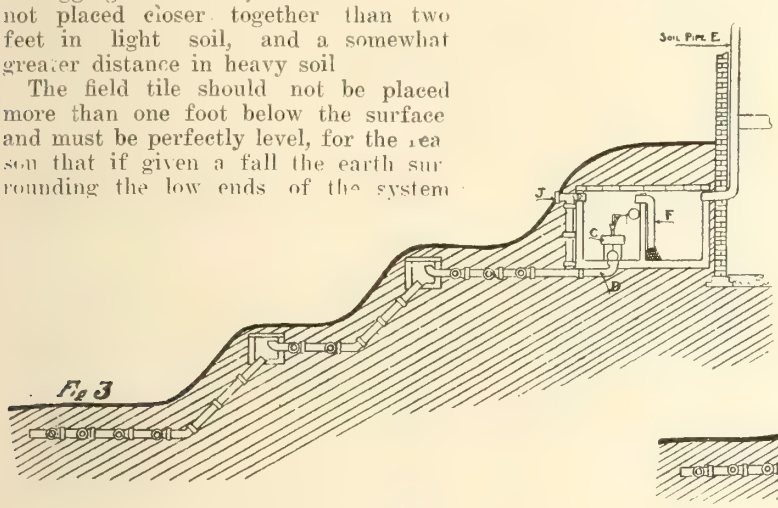


Fig. 3

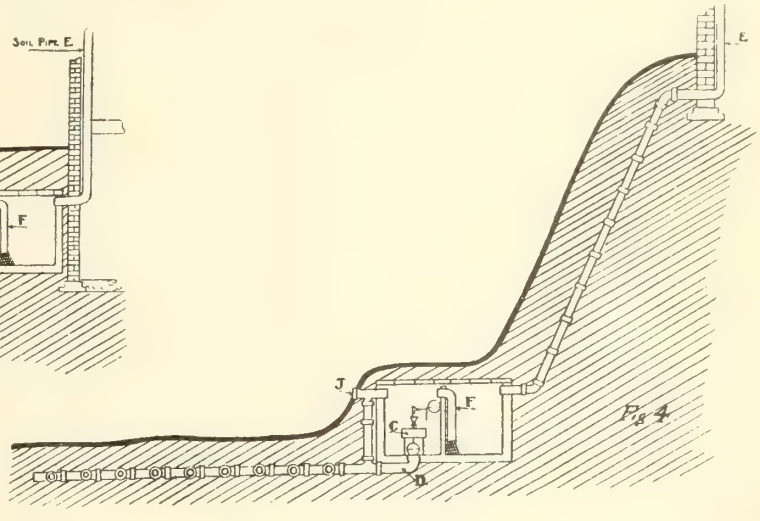


Fig. 4

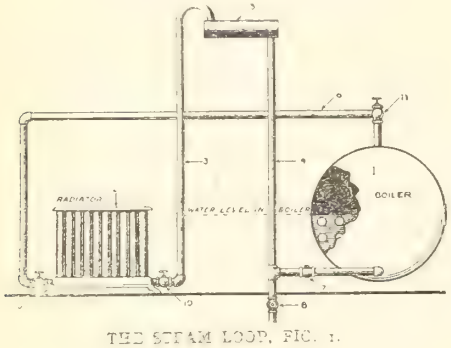
The Western Plumbing & Heating Co., Saskatoon, has received the contract for the heating and plumbing in the new court house at Saskatoon

History of the Steam Loop

Its inception and development outlined by its inventor, James H. Bleesing, in the Engineering Review

The steam loop is a device for returning the water of condensation from a heating system, located below the water level of the boiler, directly back into the boiler without in any way opening to the atmosphere. Under favorable conditions the steam loop will work as well as though the heating system were placed high enough above the water level in the boiler to permit all the water of condensation to gravitate back into the boiler.

In a general way the mode of operation of the loop is this: The heating system is so arranged that the water of condensation from the different radiators gravitates towards some low point and thence is led into the top of a receiver. After this is done it is found that owing to friction, caused by the velocity of the steam passing through the different pipes and condensation due to radiation, the steam pressure in the small drip receiver is much less than that in the boiler. This difference will determine the height or the length of the loop that must be employed so that the water will gravitate through it into the boiler;



THE STEAM LOOP. FIG. 1.

that is to say, if there is ten pounds difference in pressure, the descending leg of the loop should extend about thirty feet above the water-level in the boiler, since a column of water two and three-tenths of a foot high is equal to one pound pressure, and, given a difference in pressure of ten pounds, it would require a column of water twenty-three feet high to equal this difference in pressure. If we make the loop thirty feet high we shall have an additional length of seven feet with which to overcome friction. The water, after it reaches the top of the loop, composed of a larger section of pipe, will flow into the boiler through the descending leg with a velocity due to the extra seven feet added to the discharging leg.

The System Described.

Some of the steam loops that have been in use were constructed similar to the sketch, Fig. 7. This style of steam loop was brought to the attention of the public about 1890. In the loop shown in the cut it is not necessary to use a receiver to contain the water from many radiators as there is only one shown.

Referring to the cut, 1, is the boiler, 2, the radiator; 3, the drip pipe from the radiator; 4, the return leg; 5, a short piece of pipe larger than the receiving or discharging leg, which forms the receiver, or separator; 6 is the main steam pipe for supplying the system; 7 is a check-valve opening towards the boiler to prevent the water returning to the system; 8 and 9 are hand valves used on occasions that will be explained later.

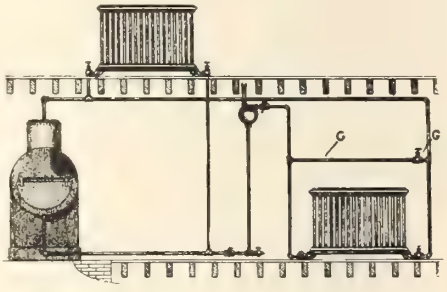
To start the loop in operation with steam in the boiler, we first open steam hand valve 9 to admit steam into the radiator, then open steam hand-valve 8 that opens to the atmosphere and the steam entering the radiator will displace the air and water from the radiator up through the drip pipe 3 into the top side of the large pipe 5, and so on down through the discharging leg 4 that leads from the bottom of the large pipe 5, and so on through the hand-valve 8 to the atmosphere. When the air and first water have been removed from the system, close the hand-valve 8, and after the discharging leg of the loop has become nearly full of the water of condensation, the circulation will continue through the check-valve 7 into the boiler. This circulation will continue so long as there is no air or an unusual flood of water, for when this happens, pipe 3 will fill solid with water. Under these conditions pipes 3 and 4 (the two legs of the loop) are equal, one balancing the other, and the circulation stops until the equilibrium is displaced by blowing through as has been before described.

Discovery Made Through Error.

During the year 1870, the proprietors of the Townsend works at Albany, N.Y., deemed it best to remove their establishment down to the river front. I concluded to use the exhaust steam for heating the foundry and part of the upper floors, and to heat the offices, machine and pattern shops with direct steam taken from a boiler to be specially installed for that purpose. I intended that the boiler should be set in a pit so that the water of condensation from the heating system of the lower floors would gravitate into it. I did not discover the gross error I had made until after nearly all the work was done, with the exception of the setting of the boiler, when I learned how impracticable it was to place the boiler low enough to have the water from the lower floors gravitate into it owing to the fact that each tide caused the level of the water in the river to rise higher than the fire box of the boiler. In order to overcome this condition it would be necessary to set the boiler in a tank anchored to prevent its floating. This would have been very expensive, and, under the circumstances, impossible.

While working on this problem, it occurred to me that after all the coils and radiators were only a part of the direct steam pipe that conveyed the steam from the boiler through them and finally terminated in the small pipes used for collecting the water of condensation.

If this smaller return pipe were connected, so I reasoned, to the top of a vessel of proper size placed a certain distance above the water level of the boiler, the water and steam would pass over into such receiver, the water falling to the bottom and separating itself from the steam. The steam pressure in the receiving vessel would be about the same as the pressure in the system at its farthest point from the boiler. If this pressure were near enough to that in the boiler and the receiver were placed at a height sufficient above the water level in the boiler so that the solid water column would make up for the difference in the pressures, the water would gravitate back into the boiler



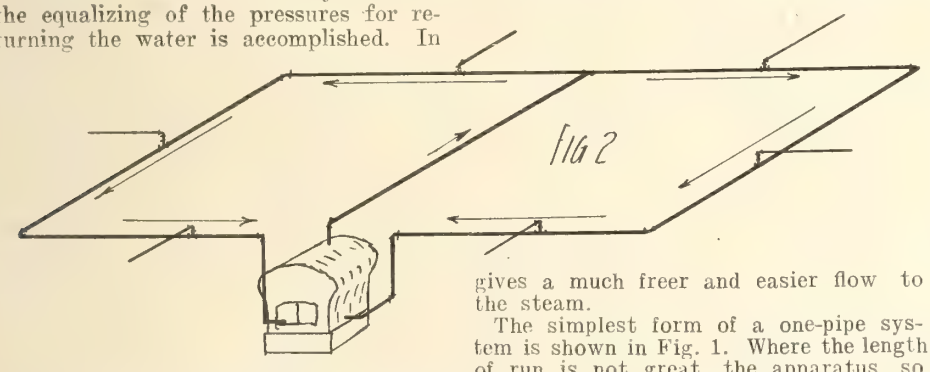
CUT SHOWING GRAVITY AND LOOP SYSTEMS. FIG. 2.

through a return pipe extending from the bottom of the receiver. With this understanding of the conditions, I prepared a spherical vessel twelve inches in diameter as the receiver to be used in the system with which I was experimenting. I believed that a receiver of the size mentioned would be ample for the purpose as the capacity was less than one gallon per minute. The receiver was placed on the floor above the boiler, where the coils were situated and about nine feet above the water level in the boiler. After the receiver was connected up and steam turned on, and the first water and air removed by blowing to the atmosphere, circulation began and was perfectly maintained. This, I believe, was the first steam loop ever made to return the water of condensation from a steam system situated below the water level of the boiler, whence the water issued in the form of steam, all without in any way opening to the atmosphere.

For a special application of the device patented Feb. 13, 1872, letters pa-

tent were granted to me on Dec. 28, 1883. Fig. 2 here shown was taken from the patent papers and is a very good representation of the device: It shows a boiler and system, of pipes and radiators, a part of the system being above the water level in the boiler and a part below. The water of condensation from the system above the water level of the boiler is arranged so as to gravitate back into the boiler. The other part of the system is on the same level with the boiler, the water being returned to the boiler by means of a special device, covered in the patent reissued in 1873, the only exception being that instead of blowing out the first water of condensation to start the circulation, an effort is made to save all the water condensed. To this end, it will be noticed, a direct steam pipe is taken from the main steam supply pipe and connected with the top of a spherical receiver. The supply pipe connected with the spherical receiver has attached to it a stop-valve, G, operated by hand a few times, until the first water of condensation is removed from the radiators and the circulation established, after which the stop-valve G may be closed and the circulation will continue as long as the steam presssure in the system is kept up.

The reader may be constrained to ask: "What is the difference between the 'steam loop' and the return steam trap? The mode of returning the water is the same in both. Without opening to the atmosphere and without any loss, both return the water of condensation to the boiler whence it issued in the form of steam and at a temperature only a few degrees less than that of the steam itself." In answer it may be said that the only difference between the two methods is in the way in which the equalizing of the pressures for returning the water is accomplished. In



the case of the "steam loop," the height of the returning water column must be great enough to make up for any difference in pressure there may be between the boiler and its steam system, e.g., if the difference in the steam pressure between a certain boiler and its system of distribution is ten pounds, the height of the return water column in the steam loop would need to be from twenty-five to forty feet above the water level in the boiler in order to maintain a circulation. With the return trap the difference in pressure is equalized, not by the length of a return water column, but by means of steam taken direct from the boiler.

PIPING FOR ONE-PIPE STEAM HEATING SYSTEM

Written for the Plumber and Steamfitter by C. E. Oldacre, Toronto.

One-pipe steam heating systems for low-pressure work meets with great favor among many on account of the decreased expense and greater simplicity. No one lay-out of method of running the mains will fit every case, but each must be adapted to meet the circumstances and the various arrangements of the building where the plant is located, as well as the relative position of the boiler to the points to which the steam need be taken.

It is desirable that the various branches that run horizontally shall not be any longer than possible, that they shall be well graded, and that they shall be of liberal size—not less than one or two sizes larger than the required connection to the radiator, according to the distance they run.

The highest point of the main is at the boiler in all cases, and the upright pipe leading from the boiler to the horizontal main or mains should be one or two sizes larger than the main. This reduces the velocity of the steam leaving the boiler, so that fewer particles of water are carried into the main and gives a much freer and easier flow to the steam.

The simplest form of a one-pipe system is shown in Fig. 1. Where the length of run is not great, the apparatus so erected will work satisfactorily.

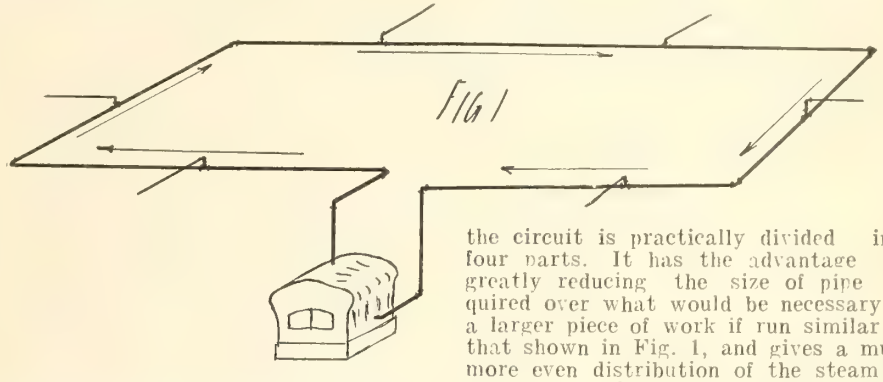
Under some conditions it will be found well to arrange the piping as shown in Fig. 2, especially if the greater part of the radiation is located on the side of the building farthest from the boiler.

This can be improved considerably and the cost of the pipe required reduced, however, if the locations of the radiators are fairly well distributed by adopting a plan similar to Fig. 3. The illustration shows the return run as a "wet return," but this may be varied to an overhead return if desirable, although it is essential to both results that one of the branches shall be dipped deeply to form a water seal before joining into the branch which would form the return.

If a branch line runs a considerable distance horizontally and carries a goodly amount of radiation, it is well to pitch or grade the branch down from the point it leaves the main and to relieve or "bleed" the lowest end directly into the return.

It is usual, also, to relieve the main into the return if the length of run is great, so as to get the water of condensation back to boiler by the shortest route, instead of flowing all the way around with the steam in the main.

Another variation of the one-pipe steam system is shown in Fig. 4. Here



the circuit is practically divided into four parts. It has the advantage of greatly reducing the size of pipe required over what would be necessary in a larger piece of work if run similar to that shown in Fig. 1, and gives a much more even distribution of the steam to points where it is required. In all cases the main, where it dips down to the boiler, should be provided with one or more air valves, according to its size, a short distance above the water line of the boiler, for the relief of the air from the main. In some cases special air valves for this purpose are provided and are of great help to the quick and easy circulation of steam to the most distant radiators and permits the use of smaller sized pipes that are often found in use.

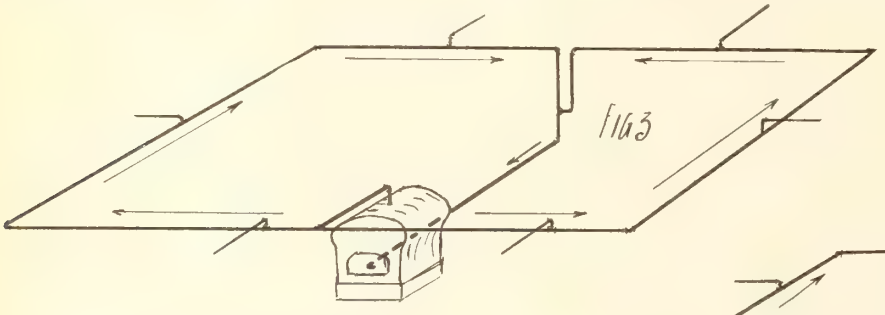
THE MUELLER GOLDEN JUBILEE.

The annual picnic which the H. Mueller Manufacturing Company, of Decatur, Ill., usually extends to its employes, took place on Sept. 7, and celebrated the fiftieth anniversary of the foundation of the business. Because of this important occasion, the arrangements for the picnic were more elaborate than usual. Saturday morning at 6.30 the first trolley car of employes and their families left Decatur for the Chautauqua grounds at Mechanicsburg, about twenty-three miles away, and car after car carried people until about 2,500 were gathered at the grounds, a natural grove of native trees, so extensive that even such a crowd did not seem to fill it up. About one hundred special guests, persons from other cities, as well as from Decatur, not connected with the business, were invited, and these were conveyed to the grounds in private coaches.

Everything possible was done by the company to make the day an enjoyable one for the employes, in addition to refreshments, sports and dancing, addresses being delivered by the Governor of Illinois, the Congressman of the district and the first apprentice to the company, now a leading lawyer at Decatur, the latter outlining the remarkable development of the Mueller business. President Adolph Mueller also spoke in appreciation of the faithful service of the em-

ployes, seven of whom had served between 20 and 36 years with the company, and to these seven, cheques of $500 each were given as a substantial recognition of their faithfull service. It was also announced that this precedent would be followed in future years.

To commemorate the golden anniversary of the company the advertising department has published a magnificent souvenir book illustrating every feature in the business, established in 1857, by the now venerated father, H. Mueller. It prospered under his wise management and, since his death, seven years ago, under the guidance of his children, until it stands to-day one of the wonders of the brass goods trade. To carry on the business, which he founded fifty years ago, H. Mueller left six sons and one daughter, and they are to-day working harmoniously and enthusiastically to perfect their institution and its 3,000 different products. The children are: Adolph Mueller, president; Henry Mueller, vice-president; Robert Mueller, secretary; Oscar B. Mueller, treasurer; Fred. B. Mueller, assistant secretary-treasurer; Philip Mueller, superintendent; Mrs. Cruickshank, one of the directors.



PRINCIPLES OF HEATING.

The latest addition to the literature of heating is just to hand in "Principles of Heating," by William B. Snow, it being one of the most concise treatises that has ever been published. It deals with the various branches of heating in a most impartial manner, and in a style that is easily grasped. Numerous references and authorities are cited so that any one that cares to go more deeply into the matter knows at once where to look for the information desired.

No one system of heating is advocated by Mr. Snow, but the facts concerning all are most fully set forth and the fund of information to be found in this work can not be duplicated in any treatise heretofore published. No one can read the work, or use it as a reference, without being benefited by it. It is well illustrated by cuts of the most modern type of heating apparatus and auxiliaries, and is replete with many useful tables and charts.

As the author states in the preface special stress has been laid on the application of the heat unit to the solving of heating problems. A complete table of contents and an index have been provided, this making the various subjects most convenient for reference.

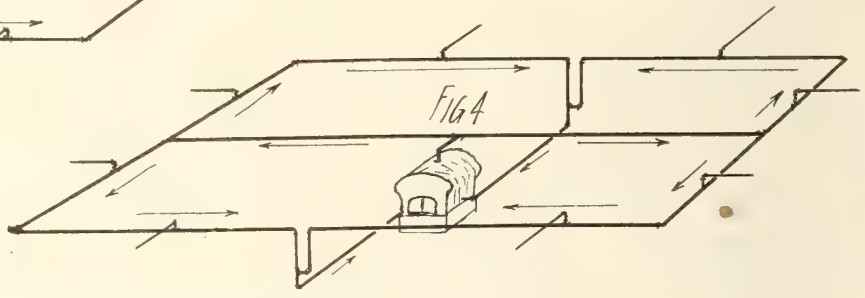
The book will retail at $2, the publishers being the David Williams Co. Copies can be secured in Canada at the same rate through the MacLean Publishing Co., Toronto.

Another valuable work recently published, is "Sizes of Flow and Return Steam Mains," published by "Domestic Engineering" at 50 cents. The book contains twenty-five heating engineers' answers to a query regarding the correct sizes of pipes in steam-heating plants, making the work valuable for reference by steamfitters. This book can also be secured through the book department of the MacLean Publishing Co., Toronto, at 50 cents, no extra charge being made for postage or customs duty.

VALUE OF KNOWLEDGE IN PLUMBING BUSINESS

Address by P. Gormly, ex-President of the National Association of Master Steam and Hot Water Fitters.

I have been in the plumbing business for thirty-three years. I served five years of that time as an apprentice, when it was necessary to learn the plumbing business. And, while I may say the business has advanced, it has advanced in certain lines, and it is a question whether the plumber as such deserves the credit for it. I remember when the man who would run iron soil pipe was considered little less than a criminal. We ran lead soil pipes wiped at the joints, made all traps, bends, etc., and we sat there and looked at them as monuments of mechanical skill. The real facts were that they were makeshifts, and we didn't know it. Improvements have come through the efforts of thoughtful men. I remember in the city of Philadelphia, about twenty-eight years ago, a young man named Walton conceived the idea that a cast trap would be much better than the one beaten from sheet lead. He tried it, succeeded in making it in two parts, soldering it together the same as he did the other one, but it was a failure. Then came the trap which we use now, which is the perfection of that particular thing.



Now, while it is most important that your work shall be of the highest class, it is also equally important that you shall appreciate the knowledge that you must necessarily possess to be successful in the plumbing business. There are few outside of the trade who realize the scope and depth of general information and knowledge necessary, from a mechanical standpoint, at least, in order that there be evolved a first-class, intelligent master plumber. He must be practically an inventive genius to overcome the obstacles that present themselves in the execution of the different lines and details of our business, and yet we must thoroughly understand the laws that govern hydraulics, pneumatics, and the action of water and fire in their combinations with air. While he may be unconscious in himself that he possesses this knowledge, and all this varied detail of knowledge, yet it is necessary that he do so, and he does it because he is trained up to it from a boy. He has had that varied experience while learning the business, and he absorbs it, if not from books and colleges, from the much more practical school of hard work and everyday observation. He is not a professor; he is not looked upon as such, but he knows things from the actual experience of handling them while the professor knows them only theoretically from his books. The question is: Do you value your knowledge at its full worth? Have you the self-control, the business acumen that is necessary to make of all this knowledge a commercial success? Because, after all is said, the last word is said, you are measured in your community largely by the commercial success you make of your knowledge.

Take the specialist in any line, the surgeon, the oculist, the electrician, and notice the fees they get in return for their knowledge? Why? Because they set upon that knowledge its true value. I will admit that many of us do not. I have known men, brilliant from a mechanical standpoint, in my city who did not understand or appreciate the mental power they had been gifted with. They did not understand how to make of that the thing that would be to them and to those who were dependent upon them valuable beyond the measure of the mediocre mind. This point of view is narrow, you will say, and it is, compared with what your National President has presented; yet while you study

carefully and thoroughly his wise advice and example in those things, remember that at all times "the laborer is worthy of his hire." How much more so is he worthy of his hire, and how much more is he appreciated who has made a life study, and not only a life study, but a successful life study, of these things for the good and use of the community.

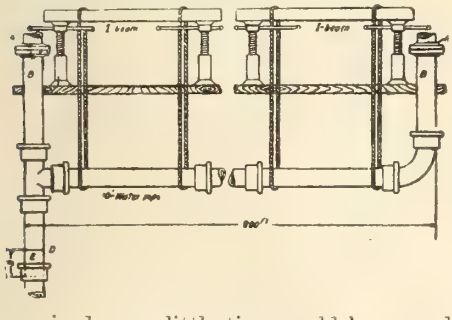
Take the syphon—it is a life study itself. The diffusion of pressure, hydraulically speaking, is a study. The fact that by the compression of a teaspoonful of water upon a receptacle already filled—the movement of a lever by which you compress there two pounds will exercise the force of hundreds of tons on the vessel—and you as plumbers understand it thoroughly. Those things are important, because if not observed and followed out in the installation of your work mechanical mistakes are made which may result in disaster. While you intuitively, and because you have done it hundreds of times, know that such and such thicknesses are necessary in metals to secure certain results, this knowledge has only come to you through experience.

Then the action of air and its cleaning qualities in passing through pipes is important. You have studied it. Who has studied it except you? People depend upon you for this knowledge, inspector or no inspector. It is necessary that you, to be successful plumbers, understand the mechanical details and the scientific details of your trade; and I simply now show the other picture, not so beautiful as the one your National President has presented, but, to my mind, equally important—that you set a just, fair and equitable price upon your knowledge.

METHOD USED FOR LOWERING WATER PIPE.

About six years ago I was employed at the works of the General Electric Co., at Peterboro, Canada, and while there had occasion to lower a cast-iron city water pipe, weighing about seven tons and 200 feet long, writes J. E. N. in the Practical Engineer. The following is a description of the method I employed without cutting the 200-foot length:

The pipe in question had to be lowered 9 inches, and as the water was constantly



required, very little time could be spared for the operation. The two pieces B and B, shown in the accompanying sketch, were of wrought iron with the two flanges screwed onto them. The rest of the pipe was heavy cast iron stock with leaded and caulked joints. First I had two nipples cut 9 inches long and a 10-inch coupling. Then I placed a number of jacks along the floor above the pipe, as the conditions were such as to prevent working at the pipes from underneath. Across every two jacks I placed an I beam and slung ropes as shown at K-K every 15 feet apart, and then had holes bored in the floor for the ropes to pass through.

When all preparations were completed I turned the water off and proceeded to cut the pipe apart at D. The flanges A and A were disconnected after chipping out the section shown at E, and by lowering the jacks about one inch at a time all along the line the pipe was lowered the desired 9 inches. I then supported the pipe properly in its new position and unscrewed the half

J, E. WALSH, MONTREAL,

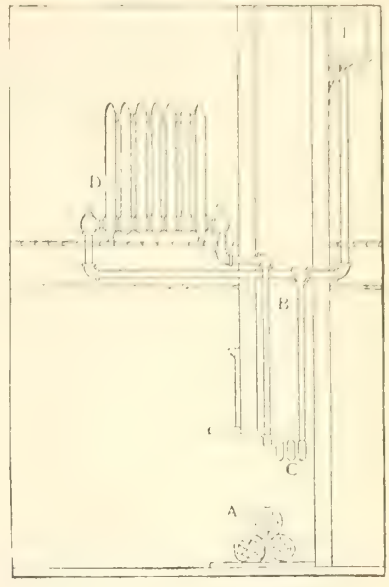
Mr. Walsh is one of the ablest young men in the trade, and is secretary of the Montreal Master Plumbers' Association, and vice-president for Quebec in the National Association.

flanges at B and B and put on the nipples and couplings and screwed the flanges on the upper thread of the nipple and made the connections.

When the city pressure was turned on not one of the caulked joints leaked a drop, and the time occupied in doing the job was only a little over one and one-half hours.

UTILIZING HEAT FROM CHIMNEY.

A correspondent in the Rural New Yorker tells how the wasted heat in a chimney of a fireplace may be utilized to advantage. Where rooms are directly over the fireplace, he writes, it may be possible to bypass the hot gases in the chimney through an old-fashioned drum, and if the size of the chimney would admit it, it would be a very easy matter to tear out some of the chimney wall and locate a pipe coil right over the fireplace in the chimney so that one or more radiators may be connected



Radiator Heated by Fireplace.

with the coil. It will be necessary to use care in placing the coil so as not to obstruct the draft.

The accompanying illustration shows how the hot water system may be installed. A is the fireplace; C the coil; B the conecting pipes; D the radiator, and E, the expansion tank. The pipe connections should be made from one end of the radiator to the top of the coil. Any series of radiators may be connected in the same manner. The expansion tank is for the expansion of the heated water as well as to keep a head of water above the radiators to keep them full.

NEW "SOVEREIGN" CATALOGUE.

The Taylor-Forbes Co., Guelph, have in their new "Catalogue G" a very handy and complete book for hot water and steam fitters in which the manufacturers give complete pictoral and printed descriptions of the construction of the various types, embodying the most scientific details known to the heating trade.

In steam boilers the "Sovereign" series now includes the "Canadian," "Western," and "Western Junior;" in hot water boilers, the "Sovereign," "Advance," and "Western Junior," and in tank heaters, the "Little Giant," "Improved Giant," and "Laundry Heater." All of these are shown in sectional and complete forms, the construction of the sections, grates and heaters being thoroughly illustrated and the many advantages peculiar to the "Sovereign" series are clearly brought out. Ratings, dimensions, sizes and price lists are also given in tabulated form, together with many valuable tables added to the back of the book for handy reference.

The book is one which should be in the hands of every person engaged in heating work and if this paper is mentioned and a business card enclosed, the firm will forward copies to any who have not already received a copy.

NEWS OF THE TRADE IN CANADA

Sigouin & Paquin, plumbers, Montreal, have dissolved.

The plumbing firm of C. N. Piedalue & Co., Montreal, have dissolved.

The Standor Valve & Fitting Co., Guelph, commenced the manufacture of cast iron fittings recently.

W. H. Meredith, sales manager of the Monarch Brass Co., Toronto, is away on a trip to British Columbia.

James Murphy, who recently established a plumbing shop at New Liskeard, is developing a fine business.

Joseph Asselin, assistant secretary Montreal M.P.A., and Frank Dexter, Truro, vice-president for Nova Scotia.

Burgess Hood, St. Catharines, has given up his plumbing business there and has secured work at his trade in Buffalo, N.Y.

The aggregate value of Toronto building permits for September, 1907, will amount to only about half that of the corresponding month last year.

The Dominion Radiator Co. are moving into their magnificent new plant alongside the C.P.R. tracks at the head of Dufferin and Lansdowne avenues, Toronto.

Eugene Charbonneau and Joseph Alex. Genest have been registered to carry on a plumbing business in Maisonneuve, (Montreal), under the firm name of Charbonneau & Genest.

James Robertson & Co., Montreal, are opening up a sales and showroom on Beaver Hall hill, in that city, as an uptown branch. W. P. Baxter will have charge of the branch.

The Sechelt Brick & Tile Company will install a $50,000 plant at Sechelt, Vancouver, B.C. An immense deposit of suitable clay has just been discovered at Sechelt, the quality of which is pronounced by experts to be equal to the best on the continent.

The Union Brass Goods Co., Toronto, has been incorporated, with a capitalization of $150,000, to carry on business as brass and iron founders. Provisional directors: Morley Punshon Vander Voort, Francis Joseph Stanley, and William Andrew Smiley, all of Toronto.

The U. T. Hungerford Brass & Copper Company, New York, has nearly completed another warehouse for storing stock. The new building adds a possible storage capacity of 5,000 000 lbs. to the stock carried in their main building.

The largest fire that has happened in New Glasgow, N.S., for years occurred recently, when the magnificent building, plant and machinery of the Standard Brick & Tile Company, were burned to the ground, and the great industrial establishment is now a mass of ruins. The loss is $300,000.

The Monterey Plumbing Co., Toronto, has been incorporated with a capital of $50,000. The company will carry on a general plumbing, steamfitting, heating and lighting business. Incorporators: Gerard Ruel, C. F. Macdonnell, A. J. Mitchell, F. C. Annesley, Robert P. Ormsby, all of Toronto.

Anthes Foundry, Limited, Toronto, has been incorporated with a capital of $100,000, to manufacture castings, iron pipe, soil pipe and fittings, and plumbers' and steamfitters' supplies. Provisional directors: Lawrence L. Anthes, William Wallbridge Vickers, and Herbert C. Sparling, all of Toronto.

The Standard Sanitary Manufacturing Co., of Pittsburg, has been incorporated and will manufacture plumbers' enamelware, brass goods, and supplies. Incorporators: T. C. Collins, J. N. Collins, F. J. M. Collins, P. M. Robertson, H. J. Trihey, all of Montreal. The share capital of the new company is $250,000, and the head office will be in Montreal.

Edward Buckley, one of the Toronto striking plumbers, was recently arrested as a result of his endeavors to induce some other workmen to leave their work and join the ranks of the strikers. Bickley had gone in the afternoon to a job in Rosedale, where a couple of plumbers in the employ of Fiddes & Hogarth were at work, and endeavored, so the police say, to persuade them to go out on strike. While thus engaged, Herbert A. Angell, Fiddes & Hogarth's foreman, happened along, and had P. C. Fraser arrest Buckley on a charge of trespass. Later in the day W. J. Storey, business agent of the Plumbers' Union, bailed the prisoner out.

The journeymen plumbers of Vancouver, B.C., have served notice on the employers that after October 1 a daily wage of $4.50 will be demanded, an advance of 50 cents above the present wage. Several of the shops have already signed the agreement, but some have declared that they will hold out against the demand, even to the extent of entering the "open shop" class. At present the only "open shop" in that city is that of Barr & Anderson. The number of journeymen plumbers in the various shops is stated to be 100 union and 25 non-union men. Two years ago the Vancouver plumbers went out on an extended strike on the question of an advance to $4.50 per day and the "closed shop." In general their demands were granted, but a short time after the wage was again put back at $4. The demand now is to gain the full limit asked during the previous strike.

AN OLD BACHELOR MARRIED.

George F. Clare, a popular member of the James Robertson Company's staff, at Toronto, surprised his friends by deserting the bachelorhood to which it was believed he was sentenced for life. Some, however, who have known the close study George has been making of George Bernard Shaw's radical books and plays, received the news with less surprise.

The event took place Thursday, Sept. 18, the "woman in the case" being Miss A. Awde, a Toronto lady. Despite an attempt to keep the event a quiet one, "the boys" caught on, and a handsome silver tea set was given the happy couple as a token of the esteem in which the bridegroom is held by his fellow-workers.

GEORGE F. CLARE, TORONTO,
For nearly twenty years with the James Robertson Company, Toronto, and also Secretary of the Central Supply Association.

Mr. Clare will soon complete two decades of faithful service to the James Robertson Company, having held positions of responsibility in Toronto and Kenora for the firm for many years. Since returning to Toronto he has also been honored by being selected as secretary of the Central Supply Association, the duties of this position, however, not being very onerous at the present time.

PLUMBING AND HEATING MARKETS

TORONTO PLUMBING MARKET.

Toronto, Sept. 24.—The demand for plumbing supplies has increased to a marked degree during the past fortnight and the local markets are growing more and more active as September advances. Harvest is now over in Ontario and farmers throughout the province have had an opportunity to plan much-needed sanitary improvements to residences and outbuildings, with the result that orders for all kinds of plumbing supplies are daily coming in to the local supply houses from plumbers in small country centres. Urban business is also much more active since most of the large city fairs are over and trade has again settled down into regular channels. With such an immense number of buildings nearing completion throughout the country, plumbing supplies are bound to be in brisk demand for the next few weeks.

Iron Pipe.—A great scarcity still exists in all the best selling sizes and, as the demand is steadily increasing, little relief can be expected for some time. The domestic mills are hopelessly behind in their orders and their output is entirely inadequate to satisfy the demands of the trade. An advance of approximately five per cent. on all sizes of pipe from 2½ to 4-inch went into effect yesterday, but otherwise prices are unchanged : ½-in. black pipe, $2.90 ; ½-in. galvanized, $3.75 ; 1-in. black, $5.60 ; 1-in. galvanized, $7.25.

Soil Pipe—The demand is good and there is a plentitude of supplies. Prices are unchanged : Medium and extra heavy pipe and fittings, up to 6-inch, 70 per cent.; 7 and 8-inch pipe, 40 and 5 per cent.; light pipe, 50 per cent.; fittings, 50 and 10 per cent.

Lead Pipe—A good September business is being done in this commodity, with the price firm at 5 per cent. off list.

Solder—The demand has strengthened considerably during the past two weeks. Wiping solder is quoted at from 23c to 25c per pound.

Brass Work—An active demand prevails and business is daily growing better. Compression work is quoted at 57½, and fuller work at 65 per cent. off list. Ground work quotations run as follows : Bibbs, 45 ; roundway, 50 ; and flatway work, 50 and 10 per cent.

Cast Iron Fittings—Business in fittings has much improved and many good orders have arrived within the last few days. The prevailing discount is still 57½ per cent., but it is quite evident that considerable price-cutting is going on.

Enamelware—A splendid September business is coming in. Enamel baths are still quoted from the October price list, but on all other lines of enamelware the January price list is adhered to.

Metals—Antimony prices are unchanged : Cookson's, 13c, and Hallett's, 12½c. The lead market continues very strong, with no change in prices. Copper prices have been shaded to from $20 to $21 for casting ingots, and $30 on round bars. This is in response to the recent break in the States, the local markets not being subject to immediate changes, following speculative doings in New York. Tin is weaker abroad on account of the declining demand and, with a growing supply available, easier prices seem probable for next year. We are now quoting from $41 to $42, although foreign prices are below this. Speculation is causing fluctuations, but futures are easier than present deliveries, As for old materials there is little to say. Stocks of most lines are plentiful and prices show no changes since our last report.

MONTREAL MARKETS

Montreal, Sept. 23. The usual activity of the fall season characterizes the trade at present. The activity is really unusual, as it is greater than that of previous years. Jobbers report a heavy demand for all seasonable lines, and the factories are busy keeping pace with it.

Iron Pipe—Makers are all busy. The demand at present possibly exceeds the production. Prices continue firm and unchanged: One-in. black, $5.60; 1-in. galvanized, $7.25.

Lead Pipe—A steady but moderate call prevails. Supplies are fully adequate for the orders being received. We continue to quote: Lead pipe, 7c; lead waste, 8c; 5 per cent. off on both.

Brass Goods—Delays in procuring supplies of raw material and difficulty in getting sufficient capable workmen are doing much to limit the output of the brass manufacturers. Considerable uncertainty exists at present regarding prices, owing to the lack of stability in the copper market. Various bases have been established and, owing to speculative agencies, they have not remained steady. It is the opinion of brass manufacturers that it will require quite a wide variation to materially affect their prices. Standard compression work, 57½ per cent. discount; fuller work, 70 per cent.

Enamelware—As far as the volume of business being transacted is concerned, this is the most satisfactory line of plumbers' supplies at present. A very active demand is experienced by all makers. The only unsatisfactory feature is the unnecessarily low prices These have been cut down to a low level owing to strong competition. We quote a discount of 15 per cent. on urinals and closets.

Cast Iron Fittings—A moderate demand prevails with adequate supplies. Prices are firm and unchanged: discount, 57½ per cent.

Hot Water Boilers—The demand in Quebec Province, especially, is becoming very strong, and local dealers are highly pleased with the way in which things are pointing. Prices are firm.

Metals—The market is becoming more active. A little stronger call for the various lines is being experienced. Copper is unsteady at $20; lead is firmer at $5.75 for bar; pig iron is very strong; Middlesboro, No. 1, $21.50; No. 2, $20.50; Summerlee, $25.50; scrap iron, $17, with slight call; heavy copper and wire, 14c; light copper, 12c; heavy red brass, 12c; heavy yellow brass, 9c; light brass, 7c; heavy lead, 4c; scrap zinc, 3¾c; No. 1 wrought iron, $14.50; No. 2, $6.

CONDENSED OR "WANT" ADVERTISEMENTS.

Advertisements under this heading 2c. a word first insertion ; 1c. a word each subsequent insertion.

Contractions count as one word, but five figures (as $1,000) are allowed as one word.

Cash remittances to cover cost **must** accompany all advertisements. **In no case** can this rule be overlooked. Advertisements received without remittance cannot be acknowledged.

Where replies come to our care to be forwarded, five cents must be added to cost to cover postage, etc.

FOR SALE.

FOR SALE—First-class set of tinsmith's tools, second-hand but almost as good as new ; includes an 8-foot iron brick, almost new. Apply Pease-Waldon Co., Winnipeg.

HARDWARE, tinware, stove and plumbing business in manufacturing town in the Niagara Peninsula ; no competition ; $250,000 factory and waterworks will be completed this summer; stock about $3,000 ; death of owner reason for selling. Box 85, Thorold, Ont.

PLUMBER'S Cabinet for sale, cost $75, stands nine feet high and is 6 feet wide, contains 68 drawers, ranging in size from 3 in. x 3 in. to 6 in. x 18 in. Am installing larger cabinet, otherwise would not think of selling. Box 649, Plumber and Steamfitter, Toronto.

BUSINESS CHANCES.

WANTED—Partner to take half interest in one of the best hardware propositions in Algoma; plumber preferred. Box 636, Plumber and teamfitter, Toronto.

OFFICE space wanted by manufacturer in Toronto : state location and terms. Box 645, Plumber and Steamfitter, Toronto.

SITUATION VACANT.

WANTED—A salesman familiar with plumbing supplies and gas ranges, to represent a Canadian manufacturer direct to the wholesale and retail trade; must have acquaintance with the trade ; best of references will be expected ; give full information concerning experience, acquaintance with the trade, salary expected ; good position for the right person. Only hose who can fill the above qualification need apply. Box 639, Plumber and Steamfitter, Toronto.

THE WANT AD.

The want ad. has grown from a little used force in business life, into one of the great necessities of the present day.

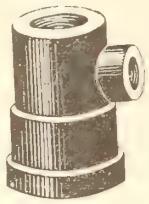
Business men nowadays turn to the " want ad." as a matter of course for a hundred small services.

The want ad. gets work for workers and workers for work.

It gets clerks for employers and finds employers for clerks. It brings together buyer and seller, and enables them to do business, though they may be thousands of miles apart.

The " want ad." is the great force in the small affairs and incidents of daily life.

The Carriage Mountings Co. have moved their business from Toronto to their new buildings at Niagara Falls, Ont., where they now have an up-to-date plant for the manufacture of automobile and carriage nickel and brass work and lavatory supplies.



Malcolm's Vent Fittings

3 x 2 x 2 inch. 3 x 2 x 1¼ inch.
3 x 2 x 1½ inch. 3 x 1½ x 2 inch.
3 x 1¼ x 2 inch.

We manufacture a full line of Vent Fittings and can give prompt shipment.

MALCOLM & CO. - Toronto

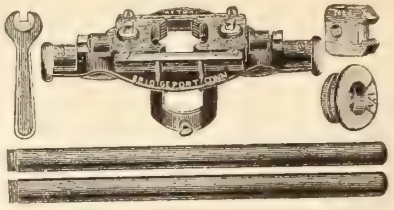
HIGH-GRADE FIXTURES

FOR THE LAVATORY

Ask for Catalog.

Are Manufactured By

The Carriage Mountings Co., Ltd., Niagara Falls, Canada



The Armstrong Manufacturing Co.

317 Knowlton St., - Bridgeport, Conn.

Manufacturers of the Genuine Armstrong Stock and Die, Malleable Iron Hinged Vises, Pipe Cutters, Pipe Wrenches, Bard Adjustable Bushings, Ratchet Attachment for Stock, Pipe Threading and Cutting-off Machine--Hand and Power. Our goods are sold by all Jobbers.

CATALOGUE MAILED ON REQUEST

The BUSY MAN'S MAGAZINE

The Cream of the World's Magazines
Reproduced for Busy People.

$2.00 per Year

THE MacLEAN PUBLISHING CO., LIMITED

Montreal Toronto Winnipeg

If you can use High-grade Low Down Compression Basin Cocks with China Index Handles, ask for the Acme Brass Works Nos. 4, 5, 6 and 7 Basin Cocks, which are just what you want. They are the acme of perfection in style, workmanship and durability.

Write us to-day.
Do not delay for to-morrow.

Acme Brass Works

CLEVELAND, O.

INSTALL THF

ONLY BRASS GOODS

MADE

GUARANTEED 5 YEARS

They make good customers

Glauber Brass Mfg. Co.

CLEVELAND, OHIO, U.S.A.

Let Our Beaver Do Your Work.

You Don't Have to Change Dies.

Cuts 1, 1¼, 1½ and 2″ perfect threads, all with one set of chasers

RAPID WORKER

The Hand Stock that Starts Easy and Finishes Easier.

"The New Way."

You Will Find it a Sure-enough Beaver.

Write for our special 10-day trial offer

You cannot afford to take the time to thread pipe by hand in any other way

Other sizes of Beavers will soon be born—¼ to ¾—2½ to 4—4½ to 8—8 to 12

Manufactured by

Borden=Canadian Company

166 Adelaide Street West, Toronto

These radiators have a larger heating surface per loop than other radiators, and the connection is larger and more efficient.

Steamfitting Satisfactorily Simplified

You know, Mr. Plumber, that many so-called simplified heating systems are more complicated and difficult to instal than even the old-fashioned kind. But if you ever have the good fortune to instal the

"SOVEREIGN" HEATING SYSTEM

you will know what really simplified heating means. There are no unexpected complications to eat up the journeyman's time, thus reducing your profit. When you specify the "Sovereign" in your tender you can calculate to an hour how long it'll take to put in. **Your profit is sure.**

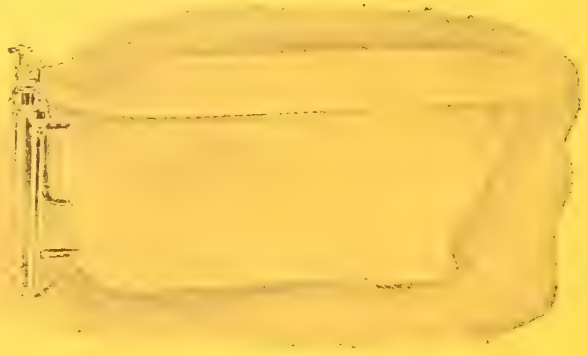
May we send you our little booklet—"Simplified Heating"?

TAYLOR-FORBES CO., Limited

Head Office and Works: GUELPH, ONT.

TORONTO—1088 King Street West. MONTREAL—122 Craig Street West. WINNIPEG The Vulcan Iron Works, Limited.

STANDARD IDEAL CAST IRON PORCELAIN ENAMELED WARE



is so constructed as to meet the requirements of the Canadian Trade. Dealers in plumbing equipment will find this Ware a splendid business getter. Standard Ideal Porcelain Enameled Ware ensures perfect sanitation and satisfies critical householders.

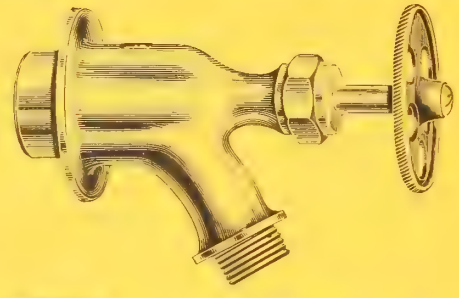
We manufacture Bath Tubs, Sitz Baths, Shower Baths, Lavatories, Urinal Ranges, Slop Hoppers, Laundry Tubs, Sinks, Closet Ranges, Steamship Supplies, Railway Car Supplies, Hospital Appliances.

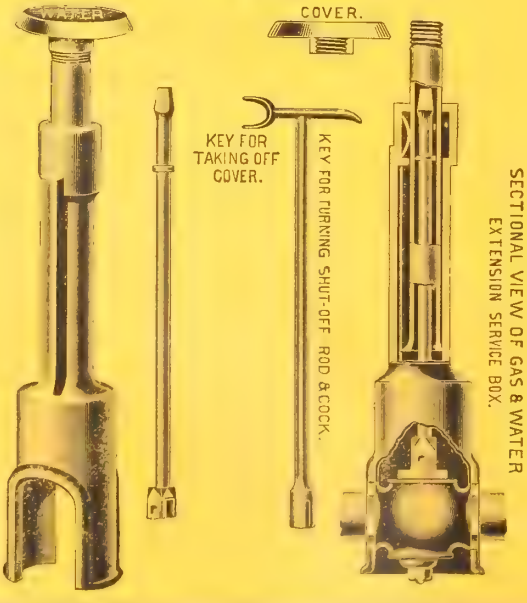
THE STANDARD IDEAL COMPANY LIMITED

Head Offices and Factories, - PORT HOPE, Ont.

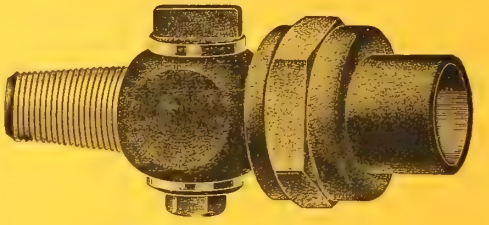
Sales Offices and Sample Rooms: TORONTO, 50 Colborne St. MONTREAL, 128 Craig St. WINNIPEG, 24 Telfer Block

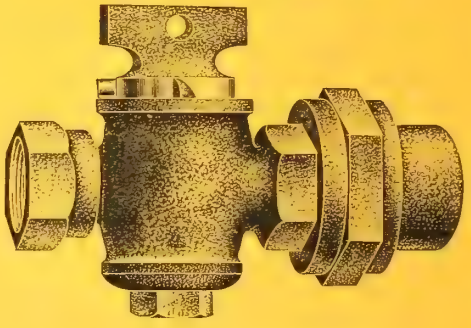
(515)





Fittings That Don't Disappoint





For

Plumbing, Water, Gas and Steam

Hays Manufacturing Co.

Complete Works: - - - ERIE, PA., U.S.A

PLUMBER & STEAMFITTER OF CANADA

THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

MONTREAL, 232 McGill St. TORONTO, 10 Front St. E. WINNIPEG, 511 Union Bank Bldg. LONDON, ENG., 88 Fleet St. E.C.

Vol. I. No. 12. (New Series). Publication Office : 10 Front St. East, TORONTO, OCT. 9, 1907. Old Series, Vol. XIX. No. 23

Nothing is too good for a good Job

Plate 556E.—China Base, Handle and Index Top.

Plate 557E.—China Handle and Index Top.

Brass Goods are Important on any Job.

WE HANDLE THE BEST

Prompt Delivery

SOMERVILLE LIMITED

59 Richmond St. East, TORONTO

When You Buy

Robertson's Acme

Low-Down or High-Up Closet Combinations

You Get the Best on the Market.

We also carry a full line of Plumbers' and Steamfitters' Supplies.
Send us your enquiries.

The James Robertson Company, Limited
Toronto and Montreal

Plate 558E.—Push Button Self-closing Faucet; China Index Top

Plumbers' Brass Work

ALL THE

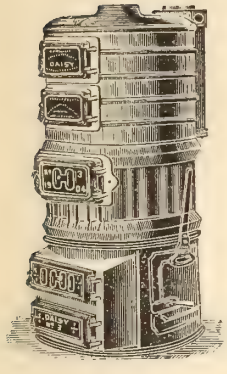
LATEST STYLES

PROMPT DELIVERY

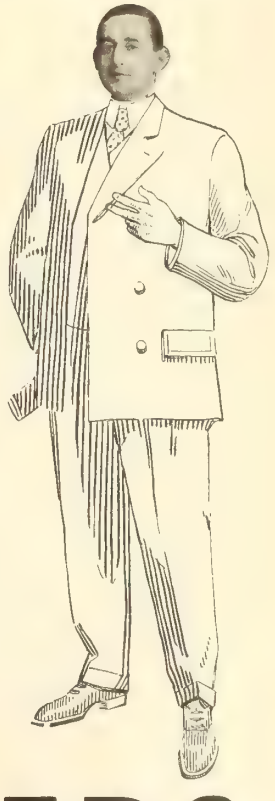
SOMERVILLE LIMITED

59 RICHMOND STREET EAST - TORONTO

Honest Ratings



The ratings of the Daisy Boiler are thoroughly honest and conservative. Every size has been carefully tested and its power accurately estimated, so that in figuring, the steamfitter is positive in gauging boiler capacity according to the published ratings. You will not be obliged to take out a Daisy.



Write for Catalogue.

CLUFF BROTHERS

Lombard Street, TORONTO

Selling Agents for WARDEN KING & SON, Limited

TO ALL WHOM IT MAY CONCERN:

This is to certify that the

"Monarch" Cocks and Valves

Manufactured by

The Monarch Brass Mfg. Co., Limited

of

Toronto and Port Colborne

ARE MADE TO WEAR

The **design**, the **metal**, the **workmanship** are all of a **high standard**. They are what are known as the **MORISH** kind, once use them you'll want **more** of them.

We employ a staff to answer enquiries. Keep them busy—they are at your service.

Factory:
Port Colborne, - Ont.

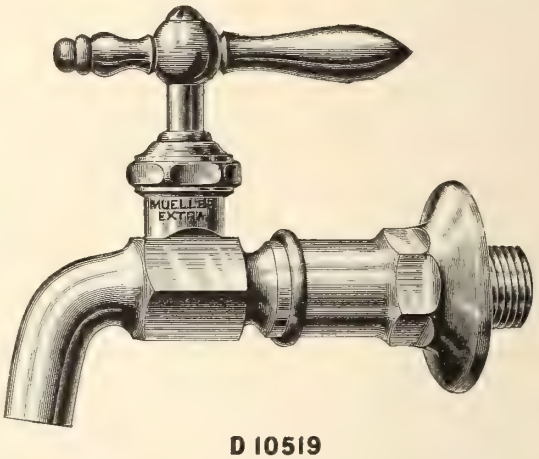
Head Office and Warehouse:
278 Dundas St. - Toronto

CHATTER LIKE MAGPIES

The magpies are pretty enough as birds to look at, but they chatter all the time. There are not many persons who will submit to them. Some Fuller work is like a magpie. It looks all right, but it chatters. Irritated customers have told you all about it.

MUELLER FULLER WORK

is designed to and does overcome this nuisance. The eccentric stem is made extra long, lessening the wear and preventing chattering. The slight taper at the point makes assembling an easy matter. Prices on application. Unconditionally Guaranteed.



D 10519
MUELLER EXTRA FULLER BIBBS
Solid Flange with Hexagon.

TRADE MARK
MUELLER
REGISTERED

Works and General Offices
DECATUR, ILL.
West Cerro Gordo Street

H. MUELLER MFG. CO.

Eastern Division
NEW YORK CITY
254 Canal St., cor. Lafayette

What Class of Men do You want to Reach?

When you insert a condensed advertisement we presume you want the largest number of responses possible from the best class of people. This cannot result through using only local mediums.

Did you ever stop to think how many Plumbers and Steamfitters read any one of our large dailies? If you have a business for sale or wish to engage a clerk you will not be content to have your advertisement seen by men in any one locality. THE PLUMBER AND STEAMFITTER is not a Montreal, Toronto or Winnipeg paper. It is an ALL CANADIAN NEWSPAPER, and reaches practically all the men engaged in the Plumbing and Steamfitting trades from the Atlantic to the Pacific. Your message will be carried quickly. THE PLUMBER AND STEAMFITTER is mailed the second Wednesday of each month. On Thursday all subscribers in Ontario should receive their copy and by the end of the week your message will have been read by practically every Plumber and Steamfitter from Halifax to Vancouver.

Rates for "condensed ads." : 2c. per word first insertion
1c. " " subsequent insertions.

PLUMBER AND STEAMFITTER

MONTREAL TORONTO WINNIPEG

NIAGARA CHAIN for PIPE HANGING

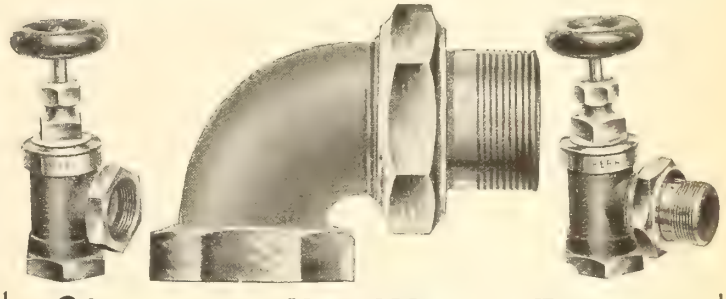
Most convenient and neatest as well as the most economical hanger on the market.

Pipe may be hung any distance from ceiling with this hanger.

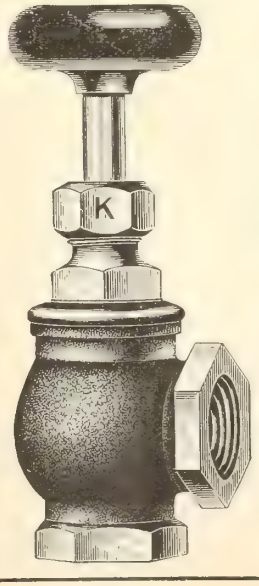
Permits of easy and exact adjustment.

Write for samples and prices.

ONEIDA COMMUNITY, Ltd.
NIAGARA FALLS, ONTARIO.



Steam & Hot Water Fitters



who handle KERR VALVES are the leading men in their line.

You should use Kerr valves for they improve your reputation for high-class work.

Made by a long established and responsible firm.

WRITE FOR CATALOG

THE KERR ENGINE CO.
Valve Manufacturers
LIMITED
WALKERVILLE, ONT.

Backed by a Guarantee

All our **Bronze** Powders and **Liquids** have the distinction of being **Guaranteed.** All plumbers and steamfitters know the necessity of having the **Best** in Bronze Powders and Liquids.

OURS NEVER FAIL

The Canadian Bronze Powder Works
MONTREAL—TORONTO
No order too large Works at Valleyfield

If your nearest dealer does not keep our goods, write us.

Modern Conveniences for Farm Homes

The Fifth of a Series of Articles Intended to Help Canadian Plumbers in Educating Residents in Country Districts to the Necessity of Better Sanitary Arrangements.

By Elmina T. Wilson, C.E.

A flush tank may be built of brick or of concrete, and is designed simply to collect the irregular house flow in order that it may be applied to the land at intervals varying from 12 to 24 hours. The size of such a tank depends upon the number of persons in the family using the water supply, which again varies with the habits of the family. The report of the data collected upon the use of water in the city of Columbus, Ohio, where 80 per cent. of the houses are metered, states that the amount of water used per capita per day varies from 60 to 100 gallons.

A Simple Flush Tank.

The simple flush tank shown in the first cut is designed for a family of six, using 60 gallons of water each per day. If the flush tank is to empty in 24 hours the tank must designed so the siphon will empty it when 360 gallons of liquid matter are collected. Counting 231 cubic inches to the gallon the capacity of the tank must be about 48 cubic feet. The depth at which the liquid will stand in the tank will be determined by the action of the siphon. The automatic siphon shown with this design will hold the sewage to a depth of 1 feet 3 inches. Whenever the tank fills to the discharging line the liquid is set in motion through the siphon, and when the tank is empty the siphon breaks, and no further discharge takes place till the tank is full again. The depth of the sewage being fixed by the siphon selected, in this example at 1 foot 3 inches, the area of the tank must be 38 square feet to hold the estimated flow. A width of 4 feet and a length of 9 feet gives about the required capacity.

Construction of Tank.

This tank is built of concrete in the proportions of 1 part of Portland cement, 2 parts of clean sand and 4 parts broken stone or gravel. If the sand contains both fine and coarse grains so much the better. The broken stone or gravel should vary in size from ¼ to 2 inches in longest dimensions, and the more variation within these limits the better.

Care should be taken to make the excavation just equal to the exterior measurements of the tank in order to save material. Slope the bottom toward the outlet and cover it with 4 inches of concrete for the floor of the tank. Set the outlet while the floor is being laid. Build the interior form as shown in the sketch, using wood screws in construction, as pounding to remove might injure the concrete. This framing is set on the floor when the cement is hardened. Inch boards are used to complete the form, and are put in place as the wall is carried up. The concrete is put in in layers from 8 to 12 inches deep, and is thoroughly rammed with a 4 or 6-inch rammer, which weighs about 20 pounds. The inlet pipe must be set at its proper elevation.

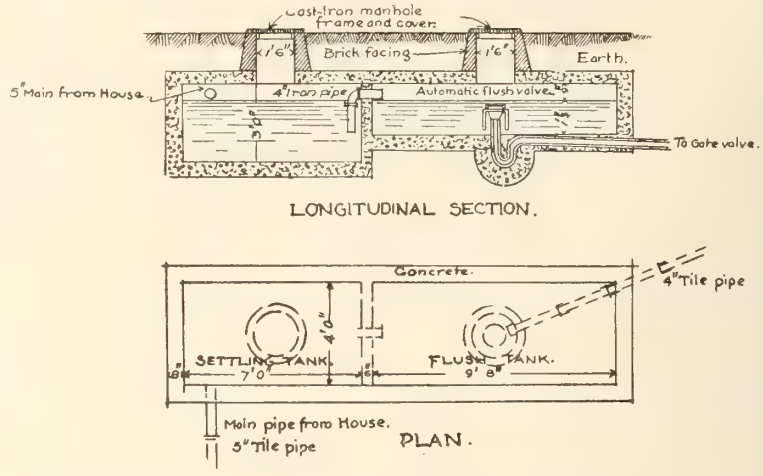


Fig. 11. Double-Chambered Flush Tank of Concrete.

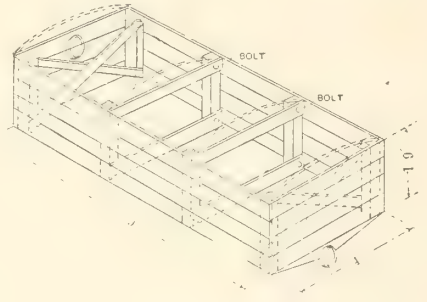


Fig. 10. Form for Building Concrete Flush Tank.

When the top of the uprights is reached segments of circles are supported on them, as shown by dotted lines in the sketch. These have a rise of about 9 inches, and should be fastened to the uprights in such a way that they can be readily removed, and so that they will not interfere with the bearing of the top on the side walls. The boards placed on these must be narrower, say, 6 inches, and the concrete must be mixed somewhat wet, as little tamping can be done, only enough to exclude the air. This arch should be set at least 5 inches thick. The manhole can be built by using sheet iron forms, made so they can be expanded or contracted in removing them. A 4-inch space between these should be sufficient. The manhole walls are carried up to the surface of the ground. After a few days the forms are removed and the interior is plastered with a mortar of 1 part cement to 2 parts clean sand.

If the boards have been given a coating of soft soap they will be the more easily removed from the concrete walls.

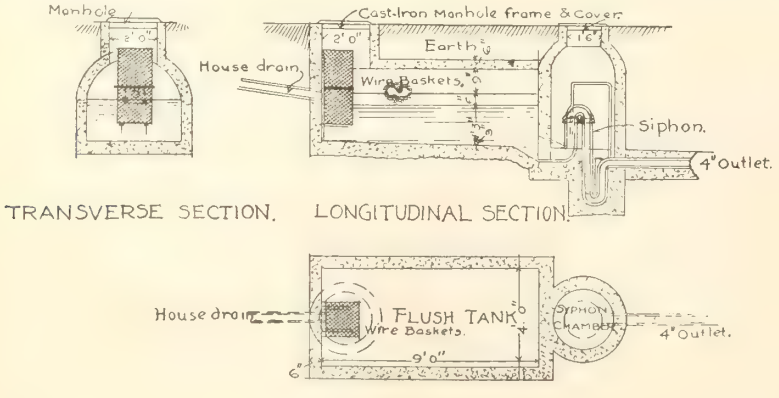


Fig. 9. Simple Flush Tank.

If at any time in building up the walls fresh concrete is to be deposited upon that which is already set the surface of the old work should be cleaned and wet and coated with a mortar made of 1 part cement and 1 part clean sand. This precaution should also be taken at the joining of the sides to the bottom of the tank. For a water-tight tank it is better to lay the walls without such joints, Where the side walls are to join the bottom of the tank the concrete should be roughened after being rammed for the floor, and a 1 to 1 mortar spread over this roughened surface when beginning to build the side walls.

The cost of the materials for the concrete in this tank will vary in diffierent localities. If Portland cement is bought at 44 cents a bag, sand at $1.50 a cubic yard and broken stone at $4 a cubic yard, an approximate estimate of the cost of the material would be $23.

Use of Screens.

When a simple flush tank like this is used paper and such coarse material should be screened out at the inlet. This is accomplished by having two baskets (16 x 16 x 16 in.), made of diamond mesh wire cloth woven of No. 12 wire, one to the inch, with an opening near the top at one side to receive the inlet pipe. Hooks are provided on the side wall to hold the basket in place, and as the sewage passes through the paper any solid matter is retained. The second basket is used as an alternate when cleaning is necessary, which should be done once a week. A very small residue will be found in the basket, and this should be removed and spaded into the ground. The basket retains all material that would be unsightly if scattered over the surface of the ground or might obstruct the drain tile in the case of subsurface disposal. A single chambered flush tank is not advisable in most cases for subsurface irrigation. The drain tile would need to be taken up and cleaned out more often than when a settling chamber is used.

Open Tanks.

These tanks may be built of brick and plastered inside with cement mortar. If desired, they can be built near the surface of the ground and left open. In this case wire cloth screens built in sections should be furnished to protect the contents against leaves and rubbish. If an open tank is desired it would be well to build it not more than 2 or 3 feet wide, and get the cubic contents necessary to contain the daily flow by increasing the length, as the narrow tank is desirable to prevent the screens from sagging. If the walls are occasionally swept down after the tank has discharged, no odor should be noticed in the neighborhood, and its location near the house could be objected to only for esthetic reasons. A tank which is open will be more likely to freeze over on the surface. To prevent this, frames covered with boards might take the place of the screens in winter. The danger from freezing is not great, as the sewage is warm when it comes from the house.

For subsurface disposal it is necessary in most cases to provide a double chambered tank, the first chamber to retain the solid matter and scum until they dissolve and the second chamber to accumulate the liquid wastes and discharge them intermittently by means of a siphon.

One type of doubled chambered tank is shown in the third cut. This tank was designed to take the place of two overloaded cesspools, which were creating disagreeable odors. The amount of sewage to be disposed of daily was estimated from the amount of water used by the family of five, the water supply being distributed through the house from a 580-gallon tank in the attic, which is filled about every other day by means of a hot air pump. The flush tank was designed to take care of 350 gallons or 70 gallons per capita per day. The pipe connecting the settling chamber with the flush tank is arranged to draw the liquid from midway between the surface and bottom of the settling chamber, so as not to disturb the solids that have settled to the bottom of the tank or the scum that floats on top.

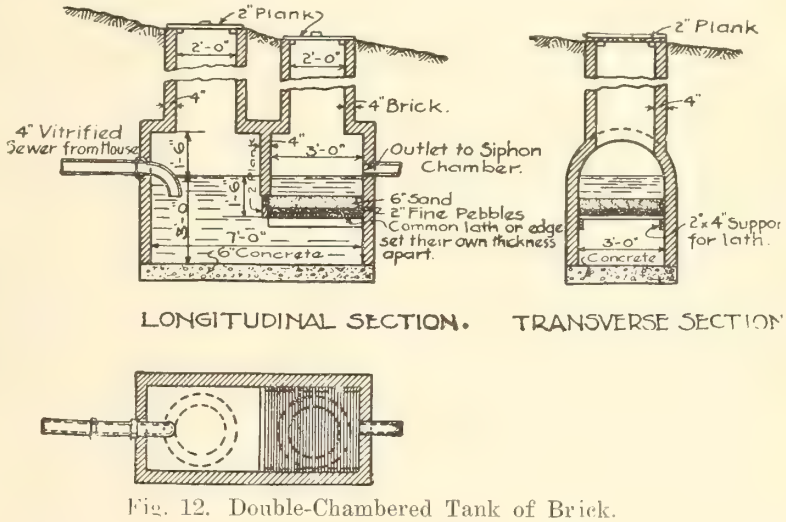


Fig. 12. Double-Chambered Tank of Brick.

All sewage coming from the house passes into the settling chamber, where the solid matter to a greater or lesser extent is deposited. Owing to the character of the sewage the decomposition of the solids is so active as to prevent any serious accumulation in the bottom of the settling chamber. It is necessary to inspect the chamber from time to time, and if undissolved solids accumulate to have them removed, probably about once a year. This accumulation when removed should be carried to the field and spaded into the soil at once.

Construction and Cost.

This tank was built of concrete in a manner very similar to that previously described for the single chambered tank. The manholes were built of brick, and the siphon placed directly under one of them for convenient access to it. The cost of the material for this tank, including the siphon and cast iron manhole covers, was $51.61. The lumber for the forms costs $9.85.

Fig. 12 shows an inexpensive collecting chamber designed by Prof. Anson Marston of the Iowa State College. The septic tank is arched over with brick, and only the two manhole covers appear on the surface of the ground. The screen of fine pebbles and of sand retains all solid matter in the sceptic chamber, and on account of the upward action of the sewage the screen does not become clogged. The siphon chamber will vary in size, depending upon whether a sand filter or subsurface irrigation is used for the second step in the purification of the sewage. With a sand filter the siphon chamber could be emptied in 8 hours; with subsurface irrigation, in 18 to 24 hours.

TROUGH CLOSETS IN ENGLAND.

The importance of modern sanitary fixtures in school buildings was emphasized at the exhibition recently held at the University of London buildings at Kensington in connection with the International Congress on School Hygiene. The exhibition contained numerous examples of the sanitary fittings now being used extensively throughout the country in both public and private schools. Commenting on these the Plumbers' Review says: "The trough closet is, of course, left out of consideration altogether, and single separate pedestal closets are now regarded as indispensable. There is still a tendency to flush a range of school closets from one automatic cistern, but this is not a satisfactory arrangement, as it permits an accumulation of excrement in the basins. It is much the best plan to flush each basin separately, and teach the children to use them properly. The most interesting exhibits, however, were the latest forms of white glazed fireclay lavatory basins where the water is continually running, either in the form of a spray or overflowing from the basin to the side channels leading to the waste outlet, the object being to prevent one person using the water left by another, and to prevent the accumulation of dirty, soapy matters on the sides of the basin. The school urinals take a similar form to those now in use for ordinary purposes, being white glazed fireclay, some having circular backs and continuous channels."

PLUMBER AND STEAMFITTER
OF CANADA

The MacLean Publishing Co.
Limited

JOHN BAYNE MacLEAN - - - President
W. L. EDMONDS - - - - Vice-President
H. T. HUNTER - - - Business Manage
WESTON WRIGLEY - - - Managing Editor

Publishers of Trade Newspapers which circulate in the Provinces of British Columbia Alberta, Saskatchewan, Manitoba, Ontario Quebec Nova Scotia, New Brunswick, P. E. Island and Newfoundland.

OFFICES.

MONTREAL - - - - - 232 McGill Street
Telephone Main 1525
TORONTO - - - - - 10 Front Street East
Telephones Main 2701 and 2702
WINNIPEG - - - 511 Union Bank Building
Telephone 3726
LONDON, ENG. - - - - 88 Fleet Street, E.C.
J. Meredith McKim
Telephone, Central 12960

BRANCHES:

CHICAGO, ILL. - - - - 1001 Teutonic Bldg.
J. Roland Kay
PARIS, FRANCE - Agence Havas, 8 Place de la Bourse
MANCHESTER, ENG. - - - 92 Market Street
ZURICH, SWITRERLAND - - - Louis Wolf
Orell Fussli & Co.

Subscription, Canada and United States, $1 00
Published Twice Every Month

OFFICERS OF NATIONAL MASTER PLUMBERS' ASSOCIATION.

Past President—F. G. Johnson, Ottawa.
President—John Watson, Montreal.
Vice President—Joseph Laurier, Montreal.
Secretary—H. A. Knox, Ottawa.
Treasurer—Harry Mahoney, Guelph.

Provincial Vice-Presidents—
Ontario—Charles Taylor, Brantford.
Quebec—J. E. Walsh, Montreal.
Nova Scotia—F. Dexter, Truro.
New Brunswick—H. Dryden, Sussex.
Manitoba—A. J. Hammond, Winnipeg.
Alberta and Saskatchewan — E. J. Young, Calgary.
British Columbia—Bert Weeks, Vancouver.

Chairmen of Committees—
Legislation—H. J. Chandler, Ottawa.
Apprenticeship—J. A. Thibeault, Montreal.
Sanitary—L. Legrow, Toronto.
Essay—G. A. Wootten, Halifax.
Organization—H. McCauley, Montreal.

WHAT IS THE MATTER?

Following the successful convention of the National Master Plumbers' Association in Montreal, six weeks ago, letters were sent to several of the newly elected officers by The Plumber and Steamfitter. Certain suggestions were made by the editor, and offers made of assistance in pushing forward the work of the association. The number of replies received, however, are exceedingly limited and as the editor has been urged by one of those who have accepted office to "wake up" some of the officers elected, the query is made: "What is the matter?"

The recent convention mapped out an aggressive plan for future work and adopted new rules aimed to prevent any "dead timber" remaining on the list of officers. Appropriations were made to cover the cost of work to be done and the machinery of the organization should have been set in motion as soon as the convention adjourned.

With a trade newspaper read by practically every plumber and steamfitter in Canada, the national and provincial associations are in a better position than ever before to do effective work and keep the trade informed regarding the work of the association. The publishers of this paper freely offer space for all association official announcements, etc., and, if the various officers will supply the matter, an "Association Page" could be published monthly or in every issue.

In previous years the association has been put to considerable expense in publishing an annual record of its proceedings in English and French editions, the cost being drfrayed largely by advertisements from manufacturers and supply houses, who also contribute liberally to the entertainment features at convention gatherings. With the publication of convention reports in The Plumber and Steamfitter, under the supervision of a press committee of the association, it appears to us unnecessary to continue the publication of the convention records months after the trade has read the proceedings in our report. The secretary would be saved much labor and the supply men much expense by the change.

The vice-president for Nova Scotia, F. Dexter, writes that the Nova Scotia association met at Halifax on September 24, and, having before them a copy of The Plumber and Steamfitter of August 28, the members were able to secure a detailed account of the convention proceedings at Montreal, while the event was still fresh in their minds. Mr. Dexter was greatly pleased with the report given and will co-operate with the publishers in seeing that every plumber in Nova Scotia becomes a reader of The Plumber and Steamfitter.

Other vice-presidents can, to the advantage of the association work in their districts, keep in close touch with this paper and encourage its circulation. Our subscription canvassers will cover Canada during the year, but the more use the association officers make of the paper the more value it will be to them.

This is the busy season of the year and the association officers, like other men in the trade, are undoubtedly busy, but a little effort and co-operation will mean much for the association and results will amply repay the trade for the work done.

THE CHIMNEY FLUE.

It is commonplace in the heating world that steam and hot water systems have superseded the hot air furnace in heating large buildings, such as factories, office buildings and public assembly halls. The larger quantity of furnaces marketed to-day are used in the smaller, low-priced residences, as a rule, and in small churches or buildings, where heat is desired at the lowest possible cost. According to A. L. Lynch, writing in a recent issue of Building Management, none of the disadvantages which occur in the circulation of hot air by means of a furnace need be considered, when steam or hot water is used. The hot water, or steam radiator, circulates the air in a room so thoroughly that all portions of it are heated to practically a uniform temperature. The greater the volume of heat given off from the radiator, the more rapid is the circulation of air in the room.

Weather conditions do not affect the efficiency of a steam or hot water heating apparatus. In certain buildings exposed to the force of the chilly winds of winter, there are rooms which it is impossible to heat with a furnace, however well it is installed. This objection can never be raised against the radiator, or hot water system. It is easily apparent, however, that in the estimation for and arrangement of the apparatus, exposure is taken into careful consideration.

When considering the use of steam or hot water as a heating system, the first important matter to consider by the architect or builder is the chimney flue. The location of the flue is not of primary consequence, but it is well to have it as near the centre of the building as possible, but that which is of greatest importance is the size of the flue and its character.

The draft in a chimney flue is spiral, probably due to the pressure of the atmosphere, and the friction caused by the draft in overcoming this pressure. Thus, a tile flue 12 inches in diameter, with an area approximately of 113 square inches, is just as effective as a 12 x 12-inch tile with an area of 144 square inches, and for this reason a chimney flue should be built round or square, or as nearly square as possible. The following table, prepared by Mr. Lynch, will be of interest to readers:

Sq. Ft. Radiation for Steam,	Size of Flue.	Sq. Ft. Radiation for Hot Water.
300 to 400	8x 8 inches	300 to 700
450 to 700	8x12 inches	800 to 1,200
700 to 1,200	12x12 inches	1,200 to 2,400
1,200 to 2,400	12x16 inches	2,400 to 3,600
2,400 to 3,500	16x16 inches	3,600 to 5,500
3,500 to 5,000	16x20 inches	5,500 to 8,000

Chimneys 16x16 inches, and larger,

should be at least 50 feet high. No chimney flue for the use of a heating apparatus should be less than 8x8 inches, and a flue 8x12 inches would be safer.

HEATING WATER BY GAS-ENGINES.

The universal adoption of gas and gasoline engines, and their use in connection with the plumbing and heating trades, has been a feature of the progress made during the past few years. A recent order for 100 ten-horse power gasoline engines, placed by the Grand Trunk Pacific Railway with the Fairbanks, Morse Manufacturing Company, Toronto, the engines to be used for water systems along their new lines of railway in Western Canada, instances one class of work to which this cheap means of producing power can be utilized. For isolated plumbing systems in farm houses, gasoline and hot air engines, have also proved their serviceability.

For heating purposes the gas engine seems likely to develop into a factor. "It is not improbable," says the Metal Worker, "that the utilization of heat in the exhaust of the gas engine offers a field for development in heating. There are very few cases, indeed, where the attempt has been made to abstract the heat discharged from the gas engine cylinder. The gas engine as a form of motive power is steadily gaining ground in this country, and it is possible even in the small size communities it pays to rig up apparatus for using heat that would otherwise go to waste. As a very rough estimate it may be stated that of the energy supplied by the gas, and in this is included gasoline and kerosene oil engines, 25 per cent. is transformed into useful work obtainable from the gas engine shaft, 50 per cent. is accounted for by the water jacket necessary to keep the working parts of the gas engine at a relatively low temperature, and that the remainder, 25 per cent., is represented in the heat of the gasses as they are discharged through the exhaust. Naturally, with different kinds of engines and different fuels operating under different conditions, the figures greatly vary, but it may be taken for the purposes of the present inquiry that the gases average in temperature about 750 degrees. This it will be seen, is sufficiently high to warm water, if such is passed through water heating appliances placed in the exhaust passages. Besides pipe coils, it is probable that the kind of water heating apparatus built for use in furnaces, in combination heating and the like, would be promising and as giving an idea of the degree of practicability of the application of the scheme a calculation can be submitted.

"Let it be supposed that a plant has a 10 h.p. gas engine. It was assumed that as much energy is delivered by the gas engine in the exhaust as is transformed into useful work by the engine itself, so that the heat of the gases represents 10 h.p. One horse power is equivalent to 2545 heat units per hour, so that 10 h.p. means the waste in the exhaust per hour gives some 25,000 of heat units. If 75 per cent. of this could be absorbed by water passed through the water heating apparatus some 19,000 heat units would be available per hour. For hot water heating apparatus it is evident that 19,000÷160=120 sq. ft. of hot water radiation would be supplied, 160 being the number of heat units given off by one square foot of the water radiation heating surface. If instead the water were used for domestic supply, it is evident that the supply of heat, assuming that 75 per cent. can be utilized, would be sufficiently great to heat 190 lbs. every hour through 100 degrees. This is equivalent to 23 gal., or 230 gal. per day of ten hours. The water passed through the jackets of the gas engine is sometimes utilized for the domestic supply, but, of course, cannot be recirculated as the object of the jacket water is to keep the temperature of the gas engine cylinder and working parts to a minimum. Sometimes the jacket water is heated enough to use in radiation after which it could be stored for shop washing and other purposes, and sometimes it is not so hot that it could not advantageously be further warmed by the waste gases as suggested."

ENGLISH RED TAPE.

As an example of English red tape, the following experience of a Canadian manufacturer would be hard to duplicate. He writes:

"The English methods of getting after the pennies makes me quite certain that they have descended from the lost ten tribes. We have had some very amusing experiences of this in our office, especially when they get after a penny and spend several to get it. We were paying a small item to an English firm, with whom we do a large business, and had asked for a sample of an article, which they sent, along with a bill at the same time for two shillings two pence, which we paid by a two-shilling postal note, but omitted to affix the two odd pennies. The firm sent back a receipt for the two shillings only on a stamped form, which cost a penny, and was unnecessary in this case, and further asked us to remit the two pennies short. We did this, of course, and they sent a receipt, thereby spending two pence to get two pence. In order to save postage, they sent the bill in an open envelope inside a circular."

A PECULIAR METAL MARKET.

Conditions in the metal market are puzzling. Manufacturers of many lines have been building new plants or enlarging existing buildings in order to supply the demand for goods. This demand still continues, manufacturers of firearms, wire nails, cut nails, iron pipe, screws, bolts and nuts, and many other lines being unable to supply goods in anything like the quantity required for prompt shipment. The iron pipe mills, for instance, have had to shut down for want of skelp, and some Canadian houses have had to import some sizes from the States in order to allow contracts to be filled in specified time. Premiums are freely offered for the scarce sizes by buyers, while manufacturers are willing to pay premiums for raw material to keep their plants in operation.

All of this is very bullish, but there is another side to the story. The drop in the copper market has, of course, affected all finished brass and copper articles, the reductions going gradually into force. The slight weakening in the iron market has encouraged buyers to look for a similar reduction in iron and steel products, a reduction which seems unlikely to materialize. Most manufacturers contracted for iron freely a year or so ago and did not have to pay the long prices asked this spring. On many lines, in consequence, no advances were made and a drop cannot, therefore, be reasonably looked for. The stoppage in building may have an effect on the demand for manufactured articles, but there will have to be a very marked falling off to warrant a reduction in prices on tools and similar articles.

The ten per cent. advance on radiators last week is another feature of the market. Notwithstanding the exceedingly brisk demand for these lines during the past year or two prices have been slashed to rock bottom figures. Now when the metal market is considered by many to be on the toboggan slide and building at a standstill, prices are advanced. All of this would be hard to understand if it were not known that the manufacturers of radiation are loaded up with business and may be unable to complete all orders this winter. The same reason which compelled stove founders to advance prices a year ago, and again this fall, has at last forced the heating apparatus men to advance their product to a profitable figure.

As stated in the first paragraph, the metal market has many puzzling features at present, and it is a brave man who essays to act the role of the prophet.

Various Schemes of Steam Heating

By A. G. King

The overhead system of piping for a job of steam heating is particularly adaptable to an office building, flat or apartment building, where the division of the space on each floor is similar.

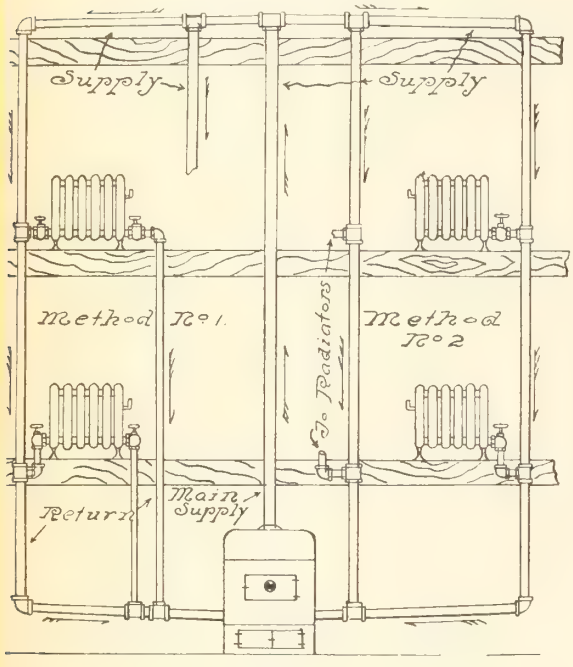


Fig. 10. Overhead System of Steam Heating.

Steam, being lighter than air, rises, displacing by pressure the air in a heating system, forcing it downward to the bottom of the system or into the atmosphere through the air vents of the radiators. When fed from overhead the radiators are less apt to get air bound. Where circumstances will permit of its installation an overhead system will be quick and positive in circulation and free from the trouble sometimes caused by water in the radiators or piping.

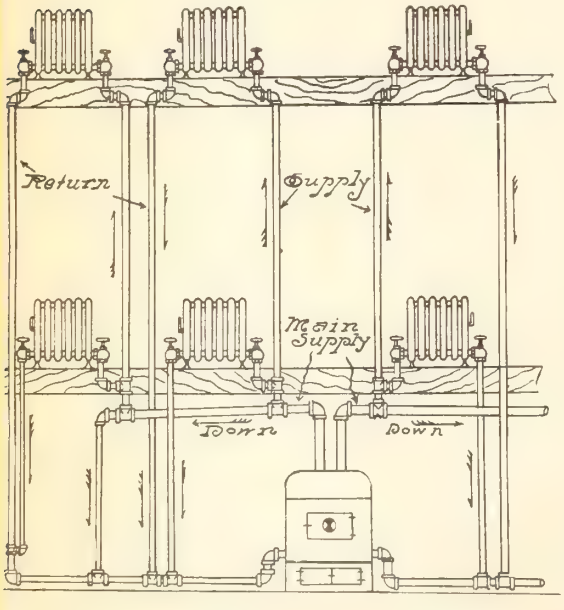


Fig. 11. Two-Pipe System of Heating.

A main pipe of ample size to supply the radiation on the job is run from the boiler to the upper storey or attic of the building in as direct a manner as possible. There it branches in as many directions as are necessary to supply the drop risers which feed steam to the various lines of radiators in the building. The top of this riser is the high point of the system and all sub-mains and branches pitch downward from it to the top of the various risers supplied.

Fig. 10 gives a very good idea of this and illustrates two methods of connecting to the radiators. Where a line of radiators is placed directly over another line of radiators it is best to use the single pipe method of connecting, as shown on the right of the illustration. Where it is necessary to project from the riser quite a distance in order to supply a radiator in an isolated position, it is frequently desirable to use the two-pipe method of connecting, as shown on the left of the illustration. In this event the supply pipe may be connected into the bottom opening of the radiator, as shown, or it may be connected into the top. The return in either case must be connected to the bottom opening of the opposite end of the radiator.

The branches out of the main in the attic are not shown in the illustration. They should be taken from the side of the main, and all return pipes from radiators connected by the two-pipe method should be run to the basement separately and there connected into the main return below the water line of the boiler. This will prevent the short-circuiting of the steam through the return, which might retard the water of condensation and thereby cause trouble.

The air valves on this system should be automatic and should be placed in the usual position on each radiator. We have known of overhead piping installed where the air was removed from the system by large automatic air valves placed on each riser in the basement above the water line. We believe, however, that the air can be more thoroughly removed by placing the air valves on each of the radiators.

The Two-Pipe System.

The two-pipe system, as we have already stated, is used more frequently in connection with high-pressure work. The piping for a system of this kind is somewhat smaller in size than that used for the one-pipe system, as the returns form an independent line of drainage from the radiators to the boiler; hence the supply need only be large enough to carry the required amount of steam to the radiators, and the return sufficiently large to carry off the water of condensation from them.

Fig. 11 shows an elevation plan of the piping for this system. For convenience in illustrating, the branches from the main are not shown. However, these branches should pitch up from the main in the same manner as described in Article 3. All return pipes and drips must be connected below the water-line of the apparatus. All risers should be connected to main by an expansion joint; that is, two elbows should be used in making the connection, in order that the pipe may have a chance to expand without causing leaks or the breaking of fittings. All mains on steam work should be hung or supported on expansion hangers, of which there are numerous varieties. This is particularly applicable where long runs of piping are necessary, as will be readily noted from the following table of pipe expansion, which shows that a main 100 feet long when fitted or put up in ordinarily cold weather will expand nearly 1½ inches when filled with steam at one pound pressure.

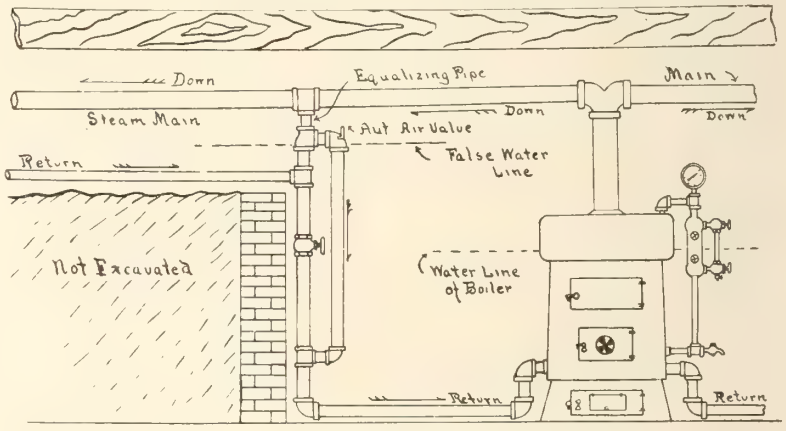


Fig. 12. Construction of a False Water Line.

Temperature of the air when pipe is fitted.	Length of pipe when fitted.	Lsngth of pipe when heated to 215 deg. ft. in.	265 deg. ft. in.	297 deg. ft in.
Zero	...100 ft.	100 1.72	100 2.12	100 2.31
32 deg.	.100 ft.	100 1.47	100 1.78	100 2.12
64. deg.	.100 ft.	100 1.21	100 1.61	100 1.87

The number of degrees above corresponding to steam pressure as follows:

215 degrees.....	1	pound pressure
265 "	25	pounds "
297 "	50	" "

False Water-lines.

Frequently it happens that a portion of the basement of the building to be heated is not excavated and circumstances preclude the use of a circuit system or a dry return. In such a case some provision must be made to run a wet return under the unexcavated portion of the building, and as this is higher than the water-line of the heating apparatus, a false water-line must be established. This may be accomplished by trapping the return at a point sufficiently high above the boiler to keep the return under the building filled with water. The main return pipe is carried under the unexcavated building in exactly the same manner as though on the basement floor. When the excavated portion of the basement is reached it is trapped as shown by Fig. 12. Note that this trap is so arranged that by the opening of valve shown it may be drained into the lower return. When this valve is closed the return remains sealed, or full of water. A pipe connection should be made from it to the main steam pipe above, as shown, in order to equalize the pressure on the return. An automatic air valve should be placed on the elbow at the highest point of the loop to free it from air.

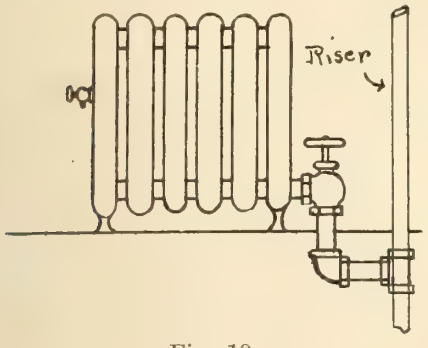


Fig. 13.

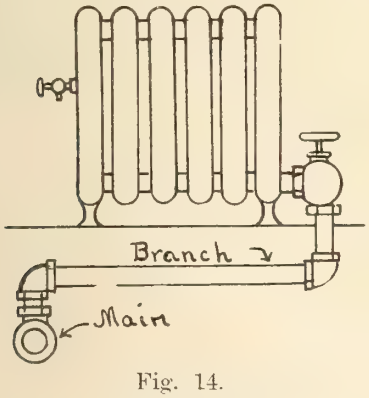


Fig. 14.

There are several methods of making a trap of this kind. The one shown, however, has our preference, as we believe it to be the best adapted for the work.

Connecting Steam Radiators.

There are many styles of connecting steam radiators and it is well to become conversant with the principal methods used. We show by Figs. 13, 14, 15 and 16 four methods of connection for one and two-pipe systems. Fig. 13 shows the manner of making a connection from riser to radiator by the one-pipe system. This is the method used for a second floor radiator when the riser is continued to the floor above. Fig. 14 shows a method of connecting a single radiator on the first floor, the main and branch being shown. We recommend a 45 degree connection from the main, that shown by the illustration being made with a 90 degree elbow. Fig. 15 illustrates one method of connecting a radiator two-pipe with an overhead feed. This may be used when there is but one radiator on the line, as all condensation must pass through the radiator. Fig. 16 shows a method of connecting a second floor radiator by the two-pipe system, the riser also feeding one or more radiators on the floor above. The returns from these upper radiators must be run independently to the basement and are not shown in the illustration.

Some fitters have more or less trouble from water-hammer or pounding, in the piping of a steam-heating apparatus. This is caused by depressions or traps in

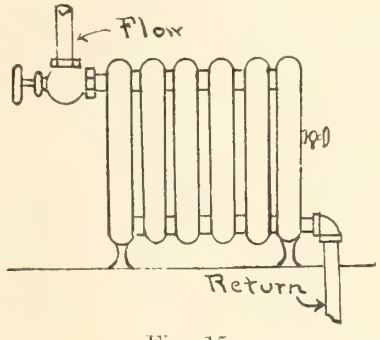


Fig. 15.

the piping where the condensation lodges and may be entirely eliminated by carefully grading all pipes and dripping with a small connection all places where a trap occurs in the piping.

Frequently in running a branch from main to a riser it is found that the main being high, or from a dip in the floor, the proper pitch cannot be given to the branch. It should be dripped by a connection into the wet return, as shown by Fig. 17. A perfectly working steam job should be absolutely free from noise, except possibly of a slight hissing noise as the air escapes at the air valve before the steam reaches and closes it.

Another one of the troubles of the fitter is the lowering of the water in the boiler. This is due to the water being carried up into the piping and radiators, where it will be held until the steam pressure is removed. Mostly this difficulty is due to faulty piping at the boiler.

The first fault leading up to this trouble is the bushing of the openings in the boiler to conform to the size of the mains. Do not use bushings. Instead make the riser out of the boiler full size of opening and use a reducing elbow on the top in starting the main. For example, a 2-inch or 2½-inch circuit is to be run and the opening in the boiler is 4 inches. Run a 4-inch riser and use a 4x2-inch or 4x2½-inch elbow on the top. By doing this the initial velocity of the steam in the riser out of the boiler will be less than the velocity in the main, resulting in a steady water-line. A good practice is to make the riser not less than twice the area of the main and if necessary, connect two

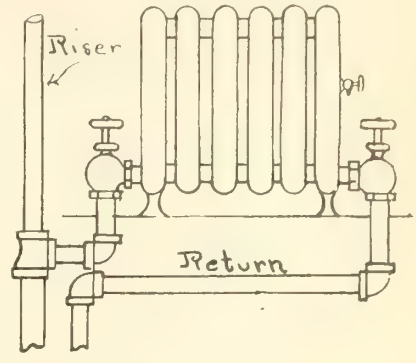


Fig. 16.

or more risers out of the boiler together, into a header, and from this header start the main.

LARGE SAVING IN WEIGHT.

Kinnear Pressed Radiators have been adopted exclusively for the immense forty-seven-storey Singer Building being erected in New York City by the Singer Maufacturing Company. This structure, when completed, will be the tallest in the world. Ernest Flagg, the architect, made a rigid examination and exhaustive test of all the radiators in the market. The test demonstrated that Kinnear Pressed Radiators exceeded every possible requirement for efficiency

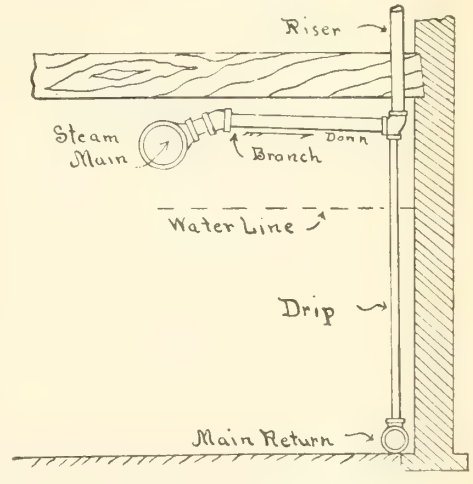


Fig. 17. Method of Draining a Steam Riser.

and durability, yet possessed the essential factors of relieving a weight in the tower alone of over one hundred tons, and affording a saving in space of forty per cent.

POPULARITY OF NON SIPHON TRAPS

Some Provisions of Cleveland's New Plumbing Code outlined in Modern Sanitation.

The pendulum of opinion, like the pendulum of time, ever swings from one extreme to the other, and what is considered good practice in one decade in the light of subsequent research proves to be no better than other methods that are condemned.

For more than a quarter of a century manufacturers of non-siphon traps and advocates of simplicity in plumbing design have fought for recognition, within certain prescribed bounds, of type of trap that would not lose its seal under the conditions likely to obtain in a well constructed drainage system. It is only within the past four years, however, that the efforts of the advance guard of sanitation have borne fruit and that recognition of non-siphon traps has been accorded in the plumbing codes of cities.

Cleveland is the latest city to be added to the list. Sections 20 and 21 of Title XI provide:

"Section 20. Re-sealing traps that stand the test prescribed may be used without back-venting on fixtures requiring two-inch and smaller traps, provided the developed length horizontal or vertical from a soil or waste pipe stack or house drain to trap does not exceed ten feet, and the combined area of all branches discharging into the soil or waste stack above them does not exceed two-thirds of the area of such soil or waste stack.

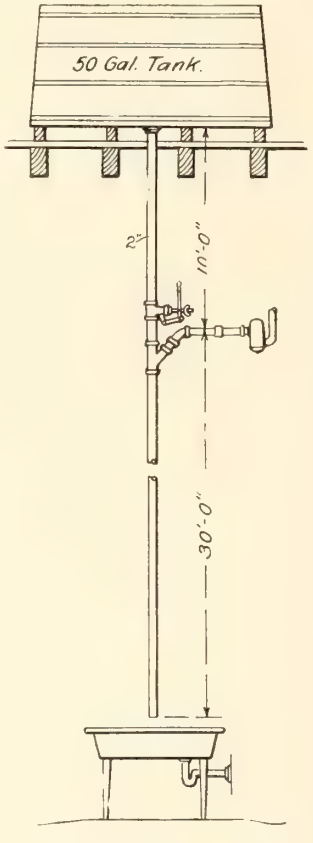
Section 21. Anti-siphon traps that stand the test prescribed may be used without back-venting on fixtures requiring two-inch and smaller traps, provided the developed length horizontal or vertical from a soil or waste pipe stack or house drain does not exceed ten feet."

A condition of the foregoing provision that recommends itself to all who are interested in sanitation is the requirement that non-siphon or refill traps successfully withstand a prescribed test before being put on the approved list. By having a standard test for traps, and a code that permits the use of any trap passing that test, the door is shut against favoritism or a discrimination against any individual or firm who wish to have their goods used A standard test for non-siphon traps that is fair to manufacturer and at the same time safeguards the public, should be adopted by every city in the Union having plumbing laws. This test should be uniform throughout the State and should have the approval of the American Society of Plumbing Inspectors and Sanitary Engineers, or some equally representative body of men, who in all fairness would prescribe the tests to be withstood. Such a condition in the plumbing trade is much to be desired; then if a firm or individual designs a new type of non-siphon or refill trap, they can submit it for a test without fear of favor and have it adopted or rejected on its merits or demerits.

A Standard Trap Test.

At the present time, Cleveland is the only city that, so far as the writer knows, has a standard trap test, and as a suggestion for a national standard trap test, that section of the code is here incorporated, to be altered or modified, as experience dictates.

"Re-sealing traps to be used within the five-foot limit shall be tested with a bell-shaped tank with capacity to fill eight feet of pipe the size of trap to be tested, and shall have a five-foot vertical arm, and after contents of tank have passed through trap the seal retained shall not be less than one and one-quarter inches deep. No movable parts will be allowed in trap when test is being made.



To Test Anti-Syphon Trap.

"Re-sealing traps to be used within the ten-foot limit shall be tested with a bell-shaped tank with a capacity to fill thirteen feet of pipe the size of trap to be tested, and shall have a ten-foot vertical arm, and after contents of tank have passed through trap, the seal retained shall not be less than one inch, and the volume of water not less than two and one-half inches seal in a plain trap. No movable parts will be allowed in trap when test is being made."

"Anti-siphon traps shall be able to stand the following test or its equivalent: Place a fifty-gallon tank ten feet above the trap connection, connect the trap to a 'Y' connection on a vertical pipe no smaller than the trap outlet and drop from this point thirty feet. The entire pipe shall be vertical and full bore throughout. Place a quick opening valve on the pipe above the trap outlet. The entire contents of the tank—fifty gallons of water—shall be discharged through this pipe by opening and closing the valve every five seconds, after which test the seal retained shall not be less than one inch in depth and the volume of water not less than the two and one-half inches seal in a plain trap. No movable parts will be allowed in trap when test is being made."

Objections Groundless.

Objection to the use of non-siphon and refill traps in many quarters arises from the mistaken opinion that the use of such traps, by cutting down the amount of plumbing work in a building, interferes with the profits of the plumbing contractors. Such an opinion is wholly wrong. In fact the converse is true. More profit is to be realized from the sale of goods than from the labor installing them, and a house owner who can install two bathrooms or one bathroom and some bedroom lavatories with non-siphon traps for what he would pay for one bathroom with a whole lot of unnecessary vent piping concealed in the walls and partitions, will install the former every time. The plumbing contractor makes his percentage of profit on an installment of equal amount without an equal amount of work, consequently his profit is greater, for if he turns over a 10 per cent. profit in two weeks, his net profit, time considered, is greater than if the same work took four weeks. Furthermore, with a given capital, a greater volume of work can be handled each year, thus increasing the gross profit in a business.

As a corollary to the foregoing, it can safely be said that the plumber who gives his patron two bathrooms with non-siphon traps for a certain price, will meet with far greater success in his business than his rival who fits up but one bathroom with vent pipes for the same price. It is pleased customers that advertise your business, and the best way to please a customer is to make every dollar paid show in fixtures.

BE A BOOSTER.

Everybody likes the man who goes around with a smile on his face. Some way or other he seems to help you by his good humor. It's an old saying that happiness is contagious, and so is a smile. On the other hand the fellow that turns up at the wrong moment, and other times, with a long face and a tale of woe makes you feel that you have lost something. Therefore look pleasant. Be a booster. If something goes wrong do not tell all the world of your trouble, but quietly go about righting things, and never lose your smile

People want to be amused, and they like to hear someone talk who always has a good word for somebody or something. Be a booster.

COST OF ASSOCIATION WORK

H. F. Baillet discusses the question of fees and dues at the recent New Jersey M.P.A. Convention.

Initiation fees and dues, being as they are, the means of support of local, state and national associations, form a very important subject for consideration. What should the amount of these imposts be? is a question upon which there seems to be a wide divergence of opinion. Of course, local conditions and requirements must govern to a large extent.

Nevertheless, it seems in a majority of cases the amount charged is guessed at in the first place and changed from time to time as necessity requires, and in the case of initiation fees upon what amount sometimes can be extorted. One association in our state charges $100 initiation and $10 per year dues; another, $25 initiation, and $24 dues; another, $25 initiation, and $9 dues; another, $10 initiation and $6 dues; another, $10 initiation and $48 dues; while another has two rates of initiation, $50 and $25 (the latter amount for all who apply within three months from date of license) and $18 year dues.

What Should Members Pay?

Now, then, the question naturally arises, Why should membership in the one case be worth $100 and in the other only $10? Either the one is charging too much or the other too little. The probability is that both assumptions are correct to an extent. On the whole, the rate charged in most locals, namely, $25, seems the most fair and equable. Anything above $50 seems to be in the nature of a hold-up for the privilege of doing business, and while necessity may and does oblige men to pay this sum in cases of strongly organized localities where close agreements exist, it, nevertheless, has the effect of deterring beginners from entering the ranks and does unquestionably tend to arouse antagonism and strengthen opposition to organization.

On the other hand, $10 is too low, and in some cases a member comes in and drops out again, perhaps in arrears for six months or more with his dues, having enjoyed the privileges and often protection of the organization for less money than the faithful member who pays $12 or $24 for dues during the same term, not to speak of the contributions made by the local on his account in dues and per capita tax to central bodies with which it may be affiliated.

Taking into consideration the average rate charged by locals in this state it seems a reasonable proposition to set the limit at say $50, with a reduction of one-half to those who show their inclination to get on the band wagon early and at the same time to make it an object for the young man starting in business to come into the fold.

Get Young Men in Early.

It is unquestionably more profitable to get the young man in early at the beginning of his business career and educate him to the proper cost of running his business and to a proper compensation for his work, than it is to keep him out by a high tariff wall and suffer under his ignorant competition, finally extorting a high admission fee in punishment, and having still the then much more difficult task of weaning him from wrong methods to right ones.

The future of our business is in the hands of the young man and every opportunity should be given him, all fair inducements offered and aid extended to start him right. As a matter of fact, our older members are not doing their best toward the young beginner. I am not doing my duty and you are not doing yours in this direction. We are not absorbing the young man as fast as we should.

When we come to the annual dues, it stands as a matter of course that the smaller locals, who meet in each others' shops and who are not affiliated with master builders and other central bodies, can get along very nicely with a lower rate than larger associations with more diversified connections.

Still the fact remains that in a majority of cases the dues are too low to cover the regular and special demands likely to arise in conducting the business of a trade association. There is no one thing that creates as much dissatisfaction and tends to disgruntle the members more than estraordinary demands upon their purse. By extraordinary I do not mean extraordinary in amount, but unusual, extra assessments for what may be termed other than ordinary expenses. There is a certain amount of expense necessary to carry on the business of an organization of this character, and where the amount of dues collected from the members is inadequate, the returns in benefits to the members will be inadequate also.

Ample Treasury an Advantage.

An ample treasury never yet has been or ever will be an obstacle to the welfare of an organization. On the contrary, shortage of funds is always an obstacle and the hardest one of all obstacles to overcome. The large majority of failures (partial or whole) of such organizations to be of value to their members is caused by inadequate dues.

In a local association of master plumbers there are certain fixed charges that all must meet. First in this category come the national and state dues or per capita tax. The national dues are $2 per annum for each man. The state dues are in most states the same as in ours, $2 per annum.

Then comes the rent, which is always with us. This usually runs from $50 to $100 per annum. As smaller associations usually use smaller rooms, we can say that on the average this item will cost $1 per man.

Next in order is the salary of your officers. Your treasurer should receive a salary as he is usually bonded and consideration must be shown in such contracts—25 cents to 50 cents per man usually will cover this expense. Your secretary should, without question, receive a liberal compensation, as next to inadequate dues, more associations fail because of incompetent and neglectful secretaries than for any other cause. He must be thorough, competent and willing to do the hundred and one things necessary for a secretary to do in order that his duties shall be properly fulfilled. Select the very best man in your midst for this office, and then pay him liberally and insist upon his work being promptly and thoroughly looked after. In small locals $2 per annum on each member for your secretary is not any too much. In large locals of about fifty members, $1.50 per member is in the same proportion, and in locals of one hundred and over, $1.25 on the same basis. These figures are the least amount a competent man is worth in our local associations. The financial secretary also is worth 50 to 75 cents per member annually. Printing, postage and stationery will cost you probably $1.50 per member if your association is alive and working. And your delegates to conventions, conferences, etc., giving their time gratis, should at least have their expenses paid by the association. This item will cost you $2 to $4 per man annually.

Have Money for Emergencies.

Another item that should be considered a fixed charge is a regular contribution on account of emergency requirements. There are of necessity many contingencies which are sure to arise, such as labor troubles, etc., when a certain amount of ready money will often save the members twice or four times the amount of their annual dues. Of course, we take it for granted that in such an emergency every member is ready and willing to do his share. But like every other business expense, it comes a great deal harder to meet it that way than if it is paid as a fixed charge in the dues.

Providing for this also in the dues avoids the necessity, as sometimes happens, of a few men digging down into their jeans to raise the necessary funds quickly and then waiting for reimbursement from slow collections. If your local is affiliated with any other central bodies such as master builders, boards of trade, etc., that expense should also be considered in the fixed rate. And a small contribution for social entertainment will help to strengthen your association.

Now it is self-evident that $6 or $10 per year dues will not pay your way according to this schedule. It will take from $16 to $24 for each member to do it, and even then economy in expenditures is necessary. In one of our smaller locals, having sixteen members, they pay $48 per year and do not find it a hardship, simply because that is the fixed charge and they get adequate results.

Reasonable initiation fees and adequate dues will bring better results all along the line than the contrary method.

BUILDING NOTES.

The new collegiate school at Ottawa will cost $225,000.

A. Peters will erect a hotel in New Westminster to cost $10,000.

Rogers and McKay, Vancouver, will build a residence at a cost of $12,000.

H. Dorenwend, Toronto, will erect an apartment house in that city to cost $20,000.

P. Roach, Toronto, will build three attached 2-storey brick dwellings at a cost of $10,000.

A new business block will be erected in Vancouver by W. Hepburn, at a cost of $22,000.

E. Hobson, Vancouver, B.C., will build an apartment house at a cost of $12,000.

A new Anglican Church will be erected at Elmwood, Man., to cost $5,000.

O. & C. Clarke, Montreal, propose to establish a factory in that city for the manufacture of brass goods providing the city will grant them a free site, with exemptions and other privileges.

NEW ZEALAND HEATING SYSTEMS

United States Consul-General William A. Prickitt, of Auckland, assisted by the consular agents elsewhere in New Zealand, describes the methods of house and office heating used in that colony, with suggestions as to how the market for equipments in this line may be developed, as follows:

The deficiency of the open-fire system of heating in the city of Auckland, which, aside from the cooking stove, is about the only manner of heating in the whole of the Auckland Province, is one of the first things that is manifest to an American who visits this city in the winter time, and he asks why do not the people make their houses and places of business comfortable when it could be done so easily. Open fires are delightful as auxiliaries, but as the main source of heat they are, as commonly used, wasteful and inefficient, a large percentage of the heat escaping through the chimney.

New Zealand has an excellent climate, but at times it is very humid and the cold and dampness of winter should be dispelled by an up-to-date system of heating. In the Auckland Province the thermometer is very seldom below the freezing point. In winter, from June to September, the temperature ranges from 32 to 60 degrees F. There is often a succession of rainy days, followed by clear, cold, bracing weather. In the clear, sunny days one finds the weather out of doors delightful, but in the house where a person wishes to sit down and be comfortable it is a different matter. The rainy days are very dreary, most of the house being chilly, damp, and disagreeable. At the large hotels one finds open fires in the drawing and smoking rooms, but the corridors are cold and cheerless, and the dining-room very seldom has a fire in it. There is very little provision for heating public buildings. The churches have no means of being heated. The city chambers have a small open fire in each room where the public business is done, but the reading rooms at the public library are not heated at all.

Having used the hot-water system in the United States, I think that it would be well adapted to the Auckland Province, because hot-water pipes begin to radiate heat almost as soon as the fire is started. In this climate large fires would not be necessary, and the system once installed the expenditure for fuel would be very moderate, taking in consideration the much greater comfort and the much less liability to illness that would be experienced. I am confident that if this system were once tried, the delightful, even temperature produced combined with the saving of labor and the greater cleanliness, would so commend it to the user that it would soon be considered indispensable. Hot-water heating is making some progress at Wellington and in the South Island, where the weather is colder

Hot-water Installations in Wellington.

The American consular agent at Wellington, writes: "There would seem to be no question that from the standpoint of health and actual comfort and also economy of labor and fuel the system of heating by hot-water radiators is far superior to the open-fire method, at any rate in buildings of a reasonable size. However, the visible comfort of an open fire appeals very strongly to the average colonial who is unused to the more up-to-date methods, while it is almost impossible to prevail upon the feminine mind to adapt itself to the hot-water system. A number of the large business structures lately erected in this city embody hot-water system installation. This includes the business premises of my firm, which were erected some four years ago. I may mention that I have just purchased and am moving into probably the only private residence in Wellington which is heated throughout by hot-water radiators."

Situation at Christchurch.

The American consular agent at Christchurch, writes: "Open coal fires have been vastly improved of late by the principle of slow combustion and by introducing the cold air from the sides of and under the hearth and the substitution of fire clay material instead of iron, the latter being used only for the grate on which the fire rests These fires are very economical, give out great heat, and require much less attention than the ordinary coal fire grate. The winter in this provincial district of Canterbury is not severe by comparison with other places, and it is only for four or five months of the year that any artificial heat is required in the rooms of dwelling houses. What, however, is required is a domestic hot-water supply for baths, etc., all the year round, and for this purpose the kitchen cooking range supplies the necessary heating power. No new house of any pretensions is being built without a hot-water supply being provided for, and this extends to the dwellings of the working classes. Therefore, I think it extremely unlikely that a double system, which steam or hot-water heated rooms would entail, will ever come into general operation in this part of New Zealand for dwellings. At the same time the double system, or a more extensive single system for hot-water supply and heating rooms, may come more into use for large buildings where there are many occupants, public libraries, hotels, etc., as new buildings are erected and provision for pipes, etc., made at the time of erection. The post and telegraph building in this city is heated by a hot-water system, and the installation is said to be satisfactory."

OLD COUNTRY PLUMBER'S VIEWS.

A correspondent of the Glasgow Evening Citizen, writing from Canada over the nom de plume of "An Old Country Plumber in Winnipeg" has lately had something to say about the working conditions in Canada, which will be of interest to readers of Plumber and Steamfitter. He writes:

"Last year we had a strike in Winnipeg, the result of which, was nothing more or less than overflooding the labor market, and I would say to those who have their eyes on Canada as a field for their labor—'Stop and consider.' A year ago in Winnipeg plumbers were working under an agreement with their employers. Since then circumstances have changed, wages have come down considerably, and in the majority of shops the cheque system has been adopted in paying the employe. What good is a cheque to a man at 6 p.m. on a Saturday? Banks are closed, and a hotel saloon is where he necessarily finds himself cashing his cheque—for he must have the cash. He has his cheque cashed all right, a goodly portion of it goes in treating the 'boys' round the bar to something they call 'Scotch.' Someone has to go without, for I will tell you right here it takes every red cent a man can work for to keep everything right, more especially if he has more mouths to feed than his own. The building total in Winnipeg amounted to close on twelve million dollars last year. These figures must seem to the average workman at home to offer unlimited scope for all kinds of tradesmen. The fact is, there are hundreds of all classes of workmen walking the streets at present.

"Montreal plumbers have the open shop to contend with, and the Master Plumbers of Toronto have also organized to fight the union, and in order to ensure the solidarity of the movement, have bonded themselves to the extent of from five hundred to five thousand dollars. Union men will be engaged only on the open shop basis. This is the outcome of overflooding the labor market. From Atlantic to Pacific one hears of little else but strikes, lockouts, or trouble of some description between employer and employe. Now, brothers of the old country unions, don't be misled by bluff. Bear in mind that you can best help your brothers in trade by keeping away from Canada. Let principle guide you, and don't have it said that old country men were the means of bursting the unions here through overflooding and 'scabbing.'"

THOUGHT HE WAS A TRAVELER.

At the Michigan Retail Hardware Association convention at Detroit a few weeks ago, Secretary Peck, of the Wisconsin Retail Hardware Mutual Fire Insurance Company, told some of his experiences while on the road selling mutual insurance. He went into one store and asked the man in charge if the proprietor was in.

"No," was the reply of the clerk, who thought he was saving his boss from being interviewed by a strange traveling salesman.

"When will he be in ?" asked Mr. Peck.

"I don't know "

"Well, give him this card and tell him he can write me if he wants to," said Mr, Peck, making for the door.

"Oh, you're Mr. Peck. Wait, Mr. Jones is upstairs and he wants to see you. I thought you were a traveler."

"Well, so I am, young fellow. But I

have been forty-two years in the retail hardware business and I long ago learned not to turn travelers down that way. In future treat travelers decently if you want to hold your job and succeed, as travelers usually have some good things to offer a merchant, more particularly if they are strangers making their first call."

Mr. Peck gave the clerk practical advice and did not forget to also rub it into Mr. Jones, the dealer who was so short-sighted as to encourage his clerks to treat travelers as though they were nuisances, while in reality the man on the road has had a wider experience and is a far better business man than many customers he calls upon for orders. The merchant and the clerk make no mistake in treating a traveler as a gentleman and friend.

OPPORTUNITIES FOR BUSINESS.

H. Gleiser, Oxbow, Sask., will build a new hotel.

Robt. Shaw, Oxbow, Sask., will erect a new business block.

Seymons & Roe, Toronto, will erect a brick dwelling at a cost of $10,000.

S. J. Castleman, Vancouver, will erect a six-storey business block to cost approximately $100,000.

A new home to be erected for the Seamen's Mission, St. John, N. B., will cost $15,000.

The congregation of Paisley St. Methodist Church, Guelph, will erect a new edifice at a cost of $10,000.

C. R. S. Dinnick, Toronto, will erect six pair semi-detached brick residences at a total cost of $30,000.

T. Gingras, Toronto, will build four pair semi-detached houses at an aggregate cost of $14,500.

R. Cassidy, Vancouver, B.C., will erect a six-storey building in that city at an approximate cost of $250,000.

Harry Weineberg, Toronto, will erect a large store on the corner of Yonge and Edwards streets, at a cost of $30,000.

The value of Vancouver building permits for the month of August was $708,775, being an advance of 131 per cent. over the $306,925 recorded for the corresponding month last year.

The new city hall for Calgary, Alta., will cost $145,000.

An Oddfellows' Hall, costing $50,000, will be erected at Strathcona, Alta.

The Imperial Bank will erect a new building at Edmonton, Alta., to cost $90,000.

J. B. Pause & Company, Montreal, have been awarded the contract for building a new jail at Montreal, the contract price being $790,000.

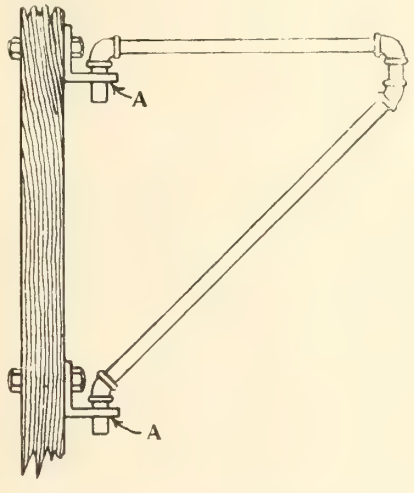
James Worts, Toronto, will build a residence to cost $18,000.

The number and value of building permits in Toronto for September has decreased considerably in comparison with September, 1906, although the aggregate for the year, so far, is well above that of the same period last year. The total in September was $550,000, but the $200,000 permit for the Alexandra Theatre has been added to this, and thus the total is $750,000. This is $152,803 below the figure for September, 1906, which was $902,803. The permits issued so far this year amount to $12 204,000, as compared with $9,566,000 for the same period of 1906.

The International Heating & Lighting Co., Edmonton, Alta,. will erect a plant for the manufacture of producer gas from straw. The plant will cost $100,000, and mains will be laid to pipe the gas to all parts of the city. Over thirty miles of these mains will be laid, entailing an expenditure of $200,000.

The sewer and water pipes are being extended in Saskatoon, and the following applications for connections have been made: Windsor Hotel, Butler Hotel, Western Hotel, City Hotel, Iroquois Hotel, King Edward Hotel, Bank of Commerce, P. C. Collins, W. R. C. Willis, J. C. Wilson, H. Wells, Willoughby & Butler.

The Windsor Hotel, Prince Albert, Sask., is undergoing some elaborate improvements. O. B. Manville has the contract for putting in baths and lavatories. The public washroom and lavatory, on the ground floor, will be modern in every respect, with tile floor and



wainscotting. The contract for heating the hotel with steam was awarded to W. S. Russell.

Ottawa will spend $28,000 in sewage construction.

Olds, Alta., has passed a by-law to raise $12,000 for fire protection.

The ratepayers of Estevan, Sask., will vote on a by-law to raise $92,000 for waterworks.

Three money by-laws were passed in Vancouver: For new sewers, $300,000; for new roads, $100,000; for schools, $45,000.

Improvements to the Y.W.C.A. building, Simcoe street, Toronto, will cost $12,000.

The congregation of St. Joseph's Church, Sydney, N.S., will erect a large edifice to replace the one recently destroyed by fire.

The Masons of Alpha Lodge, Toronto, have voted to join with other lodges in the erection of a new Masonic Hall, to be built in the northwestern part of that city, at a cost of $60,000.

The following building permits, amounting to $20,492, were taken out in Prince Albert, Sask., during August: Church of England mission; E. Kirkbright, residence; A. E. Doak, residence; M. Hooper, residence; Dr. P. D. Tyerman, warehouse; O. B. Manville, warehouse; R. Stanley, stable; Horkson Larson, residence; D. A. Hopkins, residence; A. Houle residence; O. B. Manville, residence.

The building returns for the month of August at Calgary amounted to $108,200, making a total of $1,023,820 for the eight months.

MUNICIPAL UNDERTAKINGS.

A new school building will be erected at New Westminster, B.C.

Extensions are being made to the waterworks system at Preston, Ont.

Hull, Que., will erect three new fire stations at an aggregate cost of $25,000.

A by-law to raise $40,000 for new electric pumps is to be voted on by Hamilton ratepayers.

The contract for the new City Hall at Calgary has been assigned, the contract price being $142,000.

Tenders will be asked by the Winnipeg Board of Control for a building in connection with the waterworks, to cost $20 000.

Aylmer, Que., has passed a by-law to purchase the waterworks system of that town, and another by-law to establish a sewerage system.

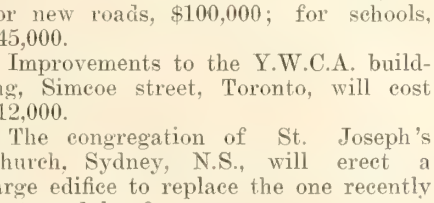
Ottawa is considering the advisability of purchasing 25,000 water power at Gatineau Falls, and erecting a power works to cost $1,250,000.

The town of Kenora, Ont., is contemplating the installation of a new arc lighting system, at a cost of $4,000 and an electric pump for the waterworks.

A petition is being circulated, asking the Aylmer, Ont., council to submit a by-law giving authority to raise $10,000, to be expended in securing an additional supply of water.

QUICKLY MADE SUPPORT OR BRACKET.

To an upright piece and where wanted bolt two pieces of iron bent in an angle, which is drilled to take the size of pipe to be used, as shown at (A) in sketch. Any size of pipe may be used, and with three nipples, two elbows, two 45-degree elbows and two pieces of gas pipe cut to fit, will form the bracket as shown when screwed together. The support can be put on upside-down by changing the nipples and angles a little, which will make a good hanger.—Popular Mechanics.


Bracket made of Pipe and Fittings.

SECRETARY KNOX BEREAVED.

Charles F. Knox, formerly in business in Ottawa with his brother, H. A. Knox, secretary of the National Association Master Plumbers of Canada, died in London, England, on Sept. 19, and was buried on Sept. 23 in Kensal Green Cemetery. Pneumonia developed into rapid decline, taking him off in his 38th year. He was a certified associate of the Sanitary Institute of Great Britain.

NEWS OF THE TRADE IN CANADA

G. A. McDonald, plumber, College St., Toronto, has assigned.

H. P. McGrath, a Galt plumber, has been appointed a member of the Brantford police force.

Harry Mahoney, treasurer of the National Master Plumbers' Assoication, was in Toronto on Monday.

Jas. Watt, sr., of Jas. Watt & Sons, Chatham, Ont., who has been quite ill for some time past, is reported to be steadily improving.

C. A. Fletcher, of the A. L. Swett Iron Works, manufacturers of hardware and plumbing specialties, Medina, N.Y., was in Toronto last week.

The opening of the enlarged Ogden school in Toronto has been delayed owing to the plumbers' strike. When completed the school will be the largest in Toronto.

John G. Sweetzer, recently in charge of the plumbing and heating department for Moore & Browne, Sault Ste. Marie, has accepted a position with a Detroit firm.

Gingras & Tradeau, plumbers of Levis, Que., have been awarded the contract for heating by hot water the Commercial Academy of Fraserville. Their tender for that installation was $3,680.

The Mechanics Supply Company, Quebec, are making additions to their large buildings on St. Paul St., Quebec. W. H. Wiggs, the manager of the company, is one of the most progressive men in the plumbing supply business in Canada.

Jas. Watt & Sons, Chatham, Ont., have received the contract for the plumbing and heating of the new residences of W. D. and H. A. Stonehouse, Wallaceburg. They are also installing a complete hot water system in Stonehouse Bros.' store.

Raoul Rinfret, of Montreal, has filed plans and specifications for the construction of Notre Dame de Quebec system of water works, Quebec, Que. Tenders will be received up to October 10, for the pipes and work, by L E. Taschereau, clerk of the municipality.

The United Brass Manufacturing Company, Cleveland, have gotten out a novel wall hanger showing the Brasstown band parading at a plumbers' convention. Each musician is performing on a piece of plumbers' brass goods, the whole design being very striking and novel. Copies can be had by mentioning this paper.

The Dominion Radiator Company's new works at the head of Dufferin street, Toronto, are now in operation with an increased staff of workmen. The offices of the company will not be moved, however, until the spring. Nothing definite has been done as yet regarding the sale of the old plant, the deal whereby the Standard Sanitary Manufacturing Company, Pittsburg, were to have taken possession not yet having been completed.

R. J. Gardiner, Chatham, Ont., who has made quite a success of his automobile enterprise in that city, has secured the Canadian manufacturing rights for the Ewer pipe wrench, and is making preparations to establish a plant for the manufacture of the wrench at Chatham. The new wrench is constructed on entirely new lines, and contains features which will undoubtedly make it one of the most popular sellers on the market.

The Canadian Brass Manufacturing Co., Galt, Ont., which was given a loan of $10,000 in order that it might be established in that city, is now in operation. The building erected is a substantial one and a credit to the Manchester of Canada. The plant consists of a foundry 60 feet long by 40 feet wide, an engine room 40 feet square and the main building, 200 feet long by 100 feet wide, consisting of two storeys and divided into the following departments: Buffing, nickel-plating, polishing, pattern, tool, core, assembling, store room and office. The company manufactures plumbers' supplies of every description, in addition to numerous other brass goods. About 25 men are at present employed, and it is expected that this number will be doubled by the end of the year. The manager is J. H. LeFavor.

Pipe, Elbows and Joints.
Fitting and Pipe Threading a Specialty.

PLANTS NEARING COMPLETION.

A representative of Plumber and Steamfitter visited the fine new plants of the King Radiator Company and the Somerville, Limited, Brass Works, on St. Helens Ave., Toronto, on Tuesday and found work on the new factory buildings very well advanced.

The new King radiator foundry is practically completed, with the cupola and other apparatus installed and a large yard filled with pig iron. The monster new machine shop is also nearing completion. The first metal will be run and castings made in about ten days' time, only a small amount of machinery being now waiting to be set up. Everything around the plant gives the air of modern methods of systematic and thorough workmanship.

Adjoining the two large King buildings is the new Somerville foundry and brass works. The finishing touches are now being put on the second storey roof and as soon as this work is done the windows will be put in and machinery already on the ground will be made ready for the power to be turned on. General Manager Fred Somerville promises to have some of the finished products of the plant ready by Dec. 1.

Both plants are magnificently situated alongside the G.T.R. tracks, just south of Bloor St. west, a spur line being run into the works.

AN ADVERTISING FALLACY.

Many advertisers have a somewhat mistaken idea of the functions of advertising. They consider that, the mere purchase of space in an advertising medium and the insertion of an advertisement, should forthwith bring them in a great deal of business—in fact, enough to justify them in saying that advertising pays. When their attempt does not have this immediate result, they at once come to the conclusion that advertising does not pay.

A business man, who runs a trial advertisement in a medium for a single insertion, hopes thereby to get replies from every reader of the paper. When only one or two answer, instead of being gratified, he is disappointed. He forgets the dozen or so more, who noted his advertisement, but who, by reason of the indolence of human nature, neglected to reply at once, and gradually forgot about it. There was no second insertion to quicken the memory and no third insertion to stir them up. The effect of the advertisement was lost on them.

Then there is another aspect of the case. Looking from the reader's standpoint, he sees one firm advertising spasmodically and another firm advertising regularly. What is his natural conclusion as to the merits of the two houses? Undoubtedly he will be led, perhaps unconsciously, to attribute greater solidity and progressiveness to the firm which uses space regularly. This is a psychological fact. It means that it pays to advertise regularly, whether the advertiser can trace direct results or not.

Again, an advertiser, who asserts that advertising does not pay oftentimes has only himself to blame. There is a way to advertise well and there is a way to advertise ill. It is for the advertiser himself to make his publicity tell. Do not be inclined to blame the medium and blame advertising in general. Rather ask if you are obtaining the best possible effects in the composition of your advertisement, both literary and typographical.

Many arguments can be brought forward to support our position. Persistency is needed in advertising as much as in anything else if success is to be obtained. Others have succeeded and it has been through continuous effort. Therefore, before condemning advertising, give it a fair and reasonable trial.

SOLDERING BRASS TO LEAD.

Scrape the lead clean and tin the brass, using tallow as flux, and muriatic acid for the lead. Use copper cleaned with sal ammoniac and tinners' solder. Be careful not to melt the lead.

PLUMBING AND HEATING MARKETS

MONTREAL.

Montreal, Oct. 7.—Local trade conditions, as far as activity is concerned, are very satisfactory. The supply men are at present wearing "the smile that won't come off," and which usually shows itself when orders are piling up nicely on their desks. All the factories are extremely busy, and the outlook for business until the end of the year, at least, is most encouraging.

Iron Pipe—Business is quite active and plumbers have some difficulty in securing sufficient pipe to finish jobs. The factories are working at their utmost capacity, and yet it seems that the production is inadequate to the demand. Prices are unchanged: One-inch black, $5.60; 1-inch galvanized, $7.25.

Lead Pipe—A steady demand exists. Supplies are adequate and prices are firm and unchanged: Lead pipe, 7c; lead waste, 8c; 5 per cent. off on both.

Cast Iron Fittings—There is a scarcity of fittings. The factories, however, are producing as fast as possible. Prices are unchanged: Discount, 57½ per cent.

Enamelware—The factories are all very busy. In local districts the trade is well supplied for the present. One or two makers have no stocks in their warehouses, having been anxious to stock up the trade, so that they may have room for reserve stocks. Some delay is experienced by makers in getting fall shipments out promptly. Navigation is drawing to a close, and as there is a scarcity, especially of C.P.R. cars, Western shipments will be rather late. Prospects for coming trade are bright, and encouraging. Prices are still low: Urinals, 15 per cent. off.

Brass Goods—A strong demand exists, almost stronger than the makers can cope with. The continued low price of copper has affected prices on brass goods, and this week makers are making an all-round reduction of approximately 10 per cent. This reduction indicates a good deal of confidence on the part of makers in the continuance of a 15-cent copper basis. As the new prices are not yet established, we continue to quote: Standard Compression Work, 57½ per cent. discount; fuller work, 70 per cent.

Radiators—An immense amount of business is being transacted at present. All makers are booking large and numerous orders. Prices are not steady, and one prominent firm has withdrawn its quotations for revision. Many are complaining of collections which are tardy.

Hot Water Boilers—Prices are firm and a large number of orders are being booked. In Quebec, especially, a very lively demand exists. Local dealers are much pleased with business.

Metals—There has been very little change in metal conditions. All lines are experiencing a good demand, and prices are unchanged. Copper is unchanged; lead is steady at $8.75 for bar; pig iron is firm at $21.50 for Middlesboro No. 1 and $20.50 for No. 2; Summerlee, $25.50; scrap iron is more active at $17; heavy copper and wire, 12½c; light copper, 11½c; heavy red brass, 11c; heavy yellow brass, 8c; light brass, 6c; heavy lead, 3¾c; scrap zinc, 3½c; No. 1 wrought iron, $14.50; No. 2, $6.00.

TORONTO.

Toronto, Oct. 8.—A splendid October business is being done in all lines of autumn and winter plumbing supplies, though jobbers are considerably handicapped by the lamentable scarcity which exists in all the best selling sizes of iron pipe. Though there are few changes in prices to record this week, many of the large manufacturers of brass goods have already given out lower prices to the trade and it would not be surprising if jobbers' prices in some lines of brass goods were reduced as much as ten per cent. below present quotations before the end of the week.

Iron Pipe—The scarcity of the most popular plumbers' sizes is more marked than ever. Such sizes as ⅜ inch black, ½ inch black, and ½ inch galvanized are extremely difficult to procure and 1¼ inch black can scarcely be had in quantities at any rate. The iron pipe mills have had to shut down for want of skelp, and some Canadian houses have had to import some sizes from the States in order to allow contracts to be filled in specified time. Premiums are freely offered for the scarce sizes by buyers, while manufacturers are willing to pay premiums for raw material to keep their plants in operation. Prices are very firm as follows:—½-in. Black Pipe, $2.90; ½-in. galvanized, $3.75; 1-in. black, $5.60; 1-in. galvanized, $7.25.

Radiators and Boilers—For the last year or two prices on boilers and radiators have been slashed to rock bottom figures, but within the last week an advance of approximately 10 per cent. went into effect on all lines of radiation. Manufacturers of radiation are loaded up with business and may be unable to complete all orders this winter. Radiators are now quoted from 50 and 2½ per cent. off to 50 and 5 off, whereas formerly they where quoted as low as from 55 to 60 off, Boiler prices are still unchanged.

Brass Work—A splendid autumn demand prevails, but prices are beginning to tumble in sympathy with the present low price of copper. The manufacturers' prices have been reduced on many lines, and it is expected that jobbers' prices on brass goods will be considerably reduced by the end of the week. Compression work has been reduced from 57½ to 60 per cent. Fuller work is still quoted at 65 per cent. of list. Ground work quotations run as follows: Bibbs, 45; roundway, 50; and flatway work, 50 and 10 per cent.

Cast Iron Fitting—Trade in fittings still continues to improve, and many good orders have arrived within the last few days. The prevailing discount is still 57½ per cent., but it is quite evident that considerable price-cutting is going on.

Enamelware—October business has opened out well. Enamel baths are still quoted from the October price list, but on all other lines of enamelware the January price list is adhered to.

CONDENSED OR "WANT" ADVERTISEMENTS.

Advertisements under this heading 2c. a word first insertion; 1c. a word each subsequent insertion.

Contractions count as one word, but five figures (as $1,000) are allowed as one word.

Cash remittances to cover cost **must** accompany all advertisements. **In no case** can this rule be overlooked. Advertisements received without remittance cannot be acknowledged.

Where replies come to our care to be forwarded, ive cents must be added to cost to cover postage, etc.

FOR SALE.

FOR SALE—First-class set of tinsmith's tools, second-hand but almost as good as new; includes an 8-foot iron brick, almost new. Apply Pease-Waldon Co., Winnipeg.

HARDWARE, tinware, stove and plumbing business in manufacturing town in the Niagara Peninsula; no competition; $250,000 factory and waterworks will be completed this summer; stock about $3,000; death of owner reason for selling. Box 85. Thorold, Ont.

PLUMBER'S Cabinet for sale, cost $75, stands nine feet high and is 6 feet wide, contains 68 drawers, ranging in size from 3 in. x 3 in., to 6 in. x 18 in. Am installing larger cabinet, otherwise would not think of selling. Box 649, Plumber and Steamfitter, Toronto.

BUSINESS CHANCES.

WANTED—Partner to take half interest in one of the best hardware propositions in Algoma; plumber preferred. Box 636, Plumber and teamfitter, Toronto.

OFFICE space wanted by manufacturer in Toronto: state location and terms. Box 645, Plumber and Steamfitter, Toronto.

SITUATION VACANT.

WANTED—A salesman familiar with plumbing supplies and gas ranges, to represent a Canadian manufacturer direct to the wholesale and retail trade; must have acquaintance with the trade; best of references will be expected; give full information concerning experience, acquaintance with the trade, salary expected; good position for the right person. Only hose who can fill the above qualification need apply, Box 639, Plumber and Steamfitter, Toronto.

THE WANT AD.

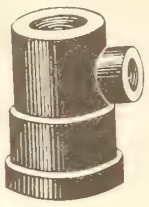
The want ad. has grown from a little used force in business life, into one of the great necessities of the present day.

Business men nowadays turn to the "want ad." as a matter of course for a hundred small services.

The want ad. gets work for workers and workers for work.

It gets clerks for employers and finds employers for clerks. It brings together buyer and seller, and enables them to do business, though they may be thousands of miles apart.

The "want ad." is the great force in the small affairs and incidents of daily life.



Malcolm's Vent Fittings

3 x 2 x 2 inch. 3 x 2 x 1¼ inch.
3 x 2 x 1½ inch. 3 x 1½ x 2 inch.
3 x 1¼ x 2 inch.

We manufacture a full line of Vent Fittings and can give prompt shipment.

MALCOLM & CO. - Toronto

329 FOR THE PRICE OF 1.

Last month three hundred and twenty nine magazines and periodicals reached the Editorial Department of the **BUSY MAN'S MAGAZINE.** Each of these was carefully ransacked by a competent editorial staff, and the most **interesting, live, up-to-date** articles selected and reproduced in the

BUSY MAN'S MAGAZINE

Think of the value of this single number of the **BUSY MAN'S** to you—containing, as it does, the cream of the world's periodical press.

You will not have to turn over a dozen pages to get one that interests you. Every article is interesting, selected as it was from a leading magazine because it was the best in that publication.

Yet this many-in-one magazine is only $2 per year.

We have a special offer which will interest you.

WRITE US TO-DAY. A POST CARD WILL DO.

THE BUSY MAN'S MAGAZINE, TORONTO

NEW NIAGARA FACTORY FALLS

We've hitched our Factory to the Falls to enable us to make ***better Bath-Room Fixtures*** than can be obtained anywhere else.

NEW ADDRESS:
The Carriage Mountings Co., Ltd., Niagara Falls, Canada

INSTALL THE

ONLY BRASS GOODS

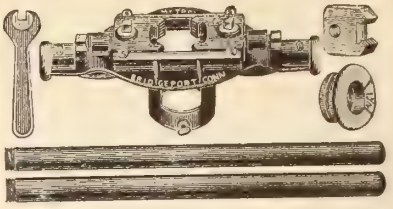
MADE

GUARANTEED 5 YEARS

They make good customers

Glauber Brass Mfg. Co.

CLEVELAND, OHIO, U.S.A.



The Armstrong Manufacturing Co.

317 Knowlton St., - Bridgeport, Conn.

Manufacturers of the Genuine Armstrong Stock and Die, Malleable Iron Hinged Vises, Pipe Cutters, Pipe Wrenches, Bard Adjustable Bushings, Ratchet Attachment for Stock, Pipe Threading and Cutting-off Machine--Hand and Power. Our goods are sold by all Jobbers.

CATALOGUE MAILED ON REQUEST

If you can use High-grade Low Down Compression Basin Cocks with China Index Handles, ask for the Acme Brass Works Nos. 4, 5, 6 and 7 Basin Cocks, which are just what you want. They are the acme of perfection in style, workmanship and durability.

Write us to-day.
Do not delay for to-morrow.

Acme Brass Works

CLEVELAND,O.

Let Our Beaver Do Your Work.

You Don't Have to Change Dies.

Cuts 1, 1¼, 1½ and 2" perfect threads, all with one set of chasers

The Hand Stock that Starts Easy and Finishes Easier.

"The New Way."

You Will Find it a Sure-enough Beaver.

Write for our special 10-day trial offer

You cannot afford to take the time to thread pipe by hand in any other way

Other sizes of Beavers will soon be born—¼ to ¾—2½ to 4—4½ to 8—8 to 12

Manufactured by

Borden-Canadian Company

166 Adelaide Street West, Toronto

Sovereign Radiators

differ in two vital points from ordinary radiators. They have a larger and better connection with the feed-pipe, and the heating surface per loop is larger. These points of superiority

Spell Money for You

because it's easier for you to sell "Sovereign" Radiators than the ordinary kind. We would like to send you our little book, "Simplified Heating." Why not send for it?

TAYLOR-FORBES CO., Limited

Head Office and Works: GUELPH, ONT.

TORONTO—1088 King Street West.
ST. JOHN, N.B.—H. G. Rogers, 53½ Dock St.

MONTREAL—122 Craig Street West.
QUEBEC, QUE.—The Mechanics Supply Company.

WINNIPEG—The Vulcan Iron Works, Limited.
VANCOUVER, B.C.—Boyd, Burns & Company.

DEALERS IN PLUMBING EQUIPMENT HAVE A PRACTICAL GUARANTEE

of larger profits and greater satisfaction in handling

STANDARD IDEAL CAST IRON PORCELAIN ENAMELWARE

Made in Canada from designs calculated to meet every requirement of the trade. It is a ware that gives perfect satisfaction wherever installed.

We make Bath Tubs, Sitz Baths, Shower Baths, Lavatories, Urinal Ranges, Slop Hoppers, Laundry Tubs, Sinks, Closet Ranges, Steamship Supplies, Railway Car Supplies, Hospital Appliances, Etc.

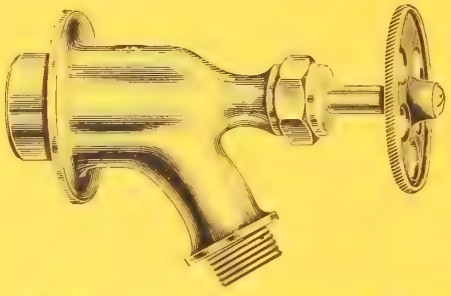
Write for Catalogue

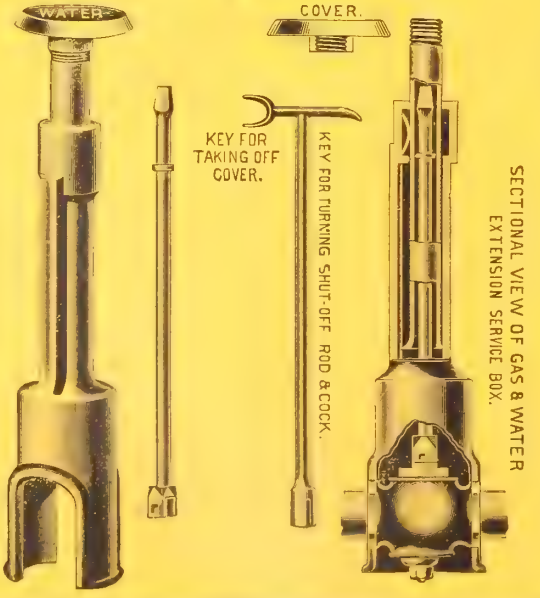
THE STANDARD IDEAL COMPANY LIMITED

Head Offices and Factories, - PORT HOPE, Ont.

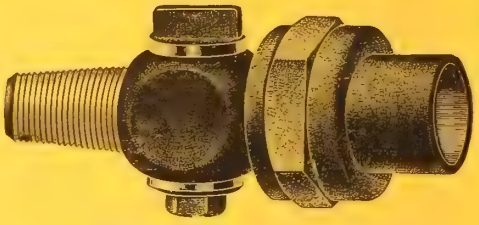
Sales Offices and Sample Rooms: TORONTO, 50 Colborne St. MONTREAL, 128 West Craig St. WINNIPEG, 24 Telfer Block

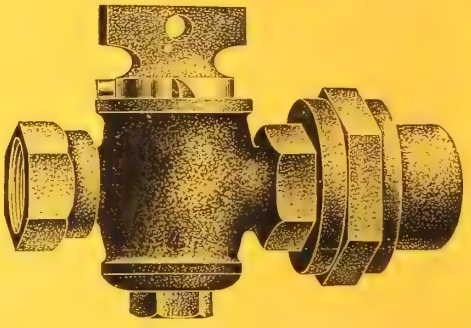
(516)





Fittings That Don't Disappoint





For

Plumbing, Water, Gas and Steam

Hays Manufacturing Co.

Complete Works: - - - ERIE, PA., U.S.A

PLUMBER & STEAMFITTER OF CANADA

THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

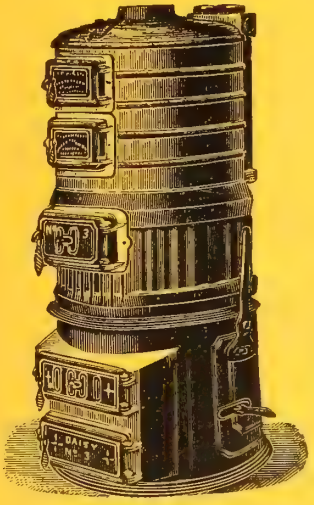
MONTREAL, 232 McGill St. TORONTO, 10 Front St. E. WINNIPEG, 511 Union Bank Bldg. LONDON, ENG., 88 Fleet St. E.C.

Vol. I. No. 14. (New Series). Publication Office : 10 Front St. East, TORONTO, OCT. 23, 1907. Old Series, Vol. XIX. No. 24

THE DAISY WAY

There is no doubt in our mind that, if a heating apparatus is required at all, it is the intention of the home builder to provide the best that the market affords. It behooves the steamfitter, therefore, to recommend to his customer the boiler that he KNOWS is going to satisfy every requirement that is expected of it.

That means the selection of the DAISY HOT WATER BOILER.



FEATURES WORTH TALKING ABOUT

Each section is so arranged that it is practically an independent heater.

The Water Post by which the different sections are connected to the firepot permits any or all sections to be shut off without interfering with the proper functions of the boiler.

Write for Catalogue

When in the market for steamfitters' supplies of any style or quantity, remember that the contents of the largest warehouse of its kind in Canada are at your disposal.

CLUFF BROTHERS

LOMBARD STREET, TORONTO

SELLING AGENTS FOR WARDEN KING & SON, Limited

When You Buy

Robertson's Acme

Low-Down or High-Up Closet Combinations

You Get the Best on the Market.

We also carry a full line of Plumbers' and Steamfitters' Supplies.
Send us your enquiries.

The James Robertson Company, Limited
Toronto and Montreal

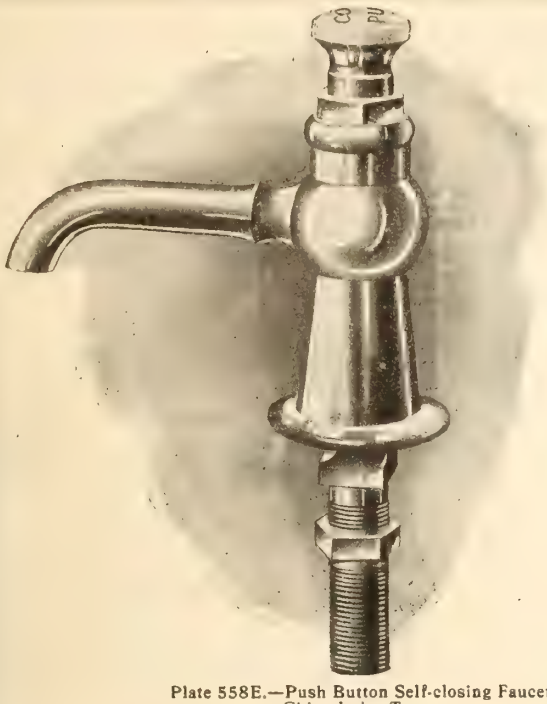


Plate 558E.—Push Button Self-closing Faucet; China Index Top

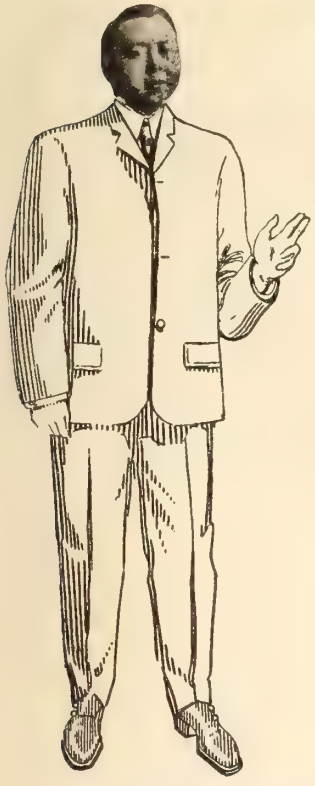
Plumbers' Brass Work

ALL THE LATEST STYLES PROMPT DELIVERY

SOMERVILLE LIMITED

59 RICHMOND STREET EAST - TORONTO

Why You Should Sell The Daisy

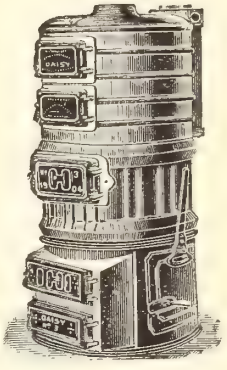


¶ *Because the quality of material used in the manufacture of the Daisy is the best procurable.*

¶ *Because every part is accurately finished and thoroughly tested and you are not required to tear down your work to remove defective parts.*

¶ *Because it is the most self-contained and easily erected boiler on the market.*

¶ *Because once the Daisy is properly installed no further time is required to care for it.*



Write for Catalogue.

CLUFF BROTHERS

Lombard Street, TORONTO

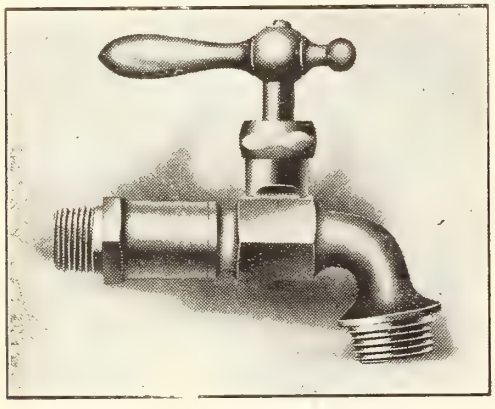
Selling Agents for WARDEN KING & SON, Limited

The "Monarch" goods have now passed the experimental stage, and have reached the practical plumbers who use them and have pleased customers.

MONARCH

All that is claimed for our Hot Water Quick-Opening Valve is realized. We don't see how much brass we can put into them, but we study the parts where it is necessary—they are built to wear.

COCKS & VALVES



The Monarch Brass Mfg. Co., Limited

Factory—Port Colborne

Warehouse and Office—

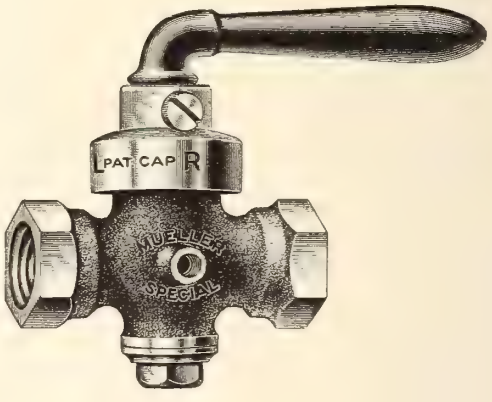
278 Dundas Street, Toronto, Ont.

UNIFORM STRENGTH IN MUELLER STOP & WASTE COCKS

A man with uniform muscular strength will last at hard labor where a man weak in any portion of muscular development will fail.

MUELLER STOP & WASTE COCKS

Are built on the lines of the uniformly strong man. Carefully made and carefully placed cores produce walls of unvarying strength and equal wearing quality. No weak spots to give way. Prices on application. Unconditionally Guaranteed.



TRADE MARK
MUELLER
REGISTERED

H. MUELLER MFG. CO.

Works and General Offices
DECATUR, ILL.
West Cerro Gordo Street

Eastern Division
NEW YORK CITY
254 Canal St., cor. Lafayette

What Class of Men do You want to Reach?

When you insert a condensed advertisement we presume you want the largest number of responses possible from the best class of people. This cannot result through using only local mediums.

Did you ever stop to think how many Plumbers and Steamfitters read any one of our large dailies? If you have a business for sale or wish to engage a clerk you will not be content to have your advertisement seen by men in any one locality. THE PLUMBER AND STEAMFITTER is not a Montreal, Toronto or Winnipeg paper. It is an ALL CANADIAN NEWSPAPER, and reaches practically all the men engaged in the Plumbing and Steamfitting trades from the Atlantic to the Pacific. Your message will be carried quickly. THE PLUMBER AND STEAMFITTER is mailed the second Wednesday of each month. On Thursday all subscribers in Ontario should receive their copy and by the end of the week your message will have been read by practically every Plumber and Steamfitter from Halifax to Vancouver.

Rates for "condensed ads." : 2c. per word first insertion
1c. " " subsequent insertions.

PLUMBER AND STEAMFITTER

MONTREAL TORONTO WINNIPEG

NIAGARA CHAIN *for* PIPE HANGING

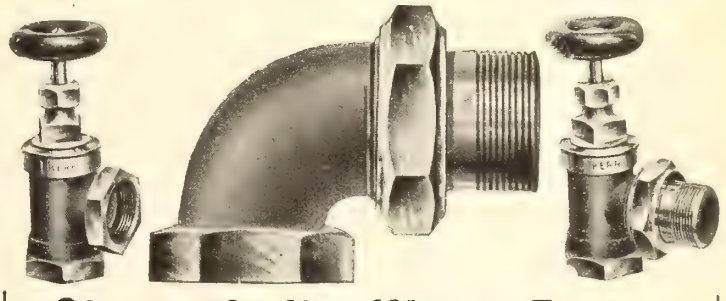
Most convenient and neatest as well as the most economical hanger on the market.

Pipe may be hung any distance from ceiling with this hanger.

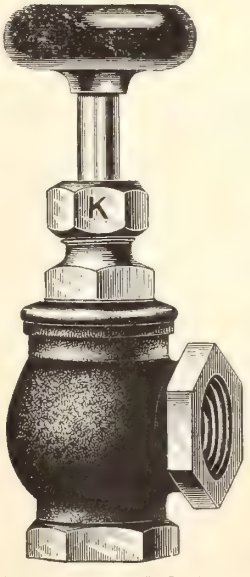
Permits of easy and exact adjustment.

Write for samples and prices.

ONEIDA COMMUNITY, Ltd.
NIAGARA FALLS, ONTARIO.



Steam & Hot Water Fitters



who handle KERR VALVES are the leading men in their line.

You should use Kerr valves for they improve your reputation for high-class work.

Made by a long established and responsible firm.

WRITE FOR CATALOG

THE KERR ENGINE CO.
Valve Manufacturers
LIMITED
WALKERVILLE, ONT.

Backed by a Guarantee

All our **Bronze** Powders and **Liquids** have the distinction of being **Guaranteed.** All plumbers and steamfitters know the necessity of having the **Best** in Bronze Powders and Liquids.

OURS NEVER FAIL

The Canadian Bronze Powder Works
MONTREAL—TORONTO
No order too large **Works at Valleyfield**

If your nearest dealer does not keep our goods, write us.

Water Supply for Country Residences

Plan of a system installed in a country residence in New York, as outlined in the Engineering Review

As shown on Fig. 1, the water supply is derived from three springs located on the property, only two of which, however, are in use at the present time. The capacity of these two springs together is equal to 10,000 gallons per day. The springs are surrounded by a water-tight curb of stone masonry, footed below frost line, and carried up 18 inches above grade. The structures are finished with an hexagonal, pyramid-shaped, white pine frame, with heavy guard wire panels covered with copper mosquito wire. These covers are made removable, being secured with hasps with spring padlocks.

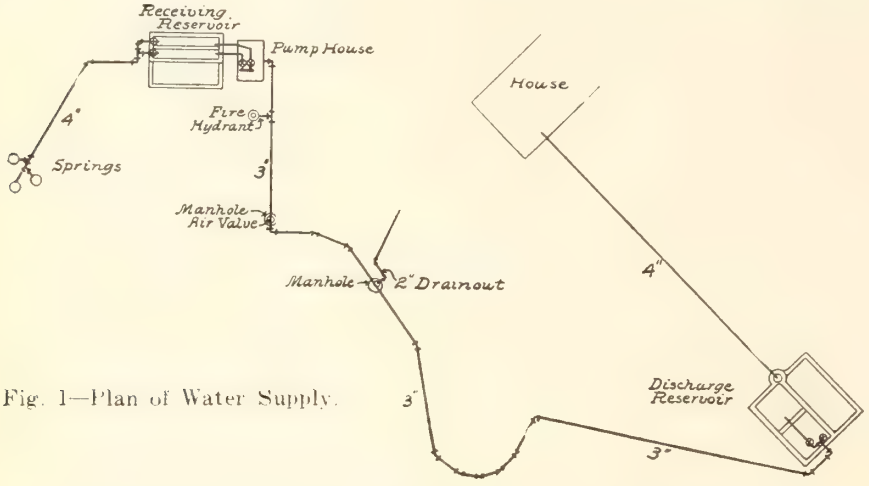


Fig. 1—Plan of Water Supply.

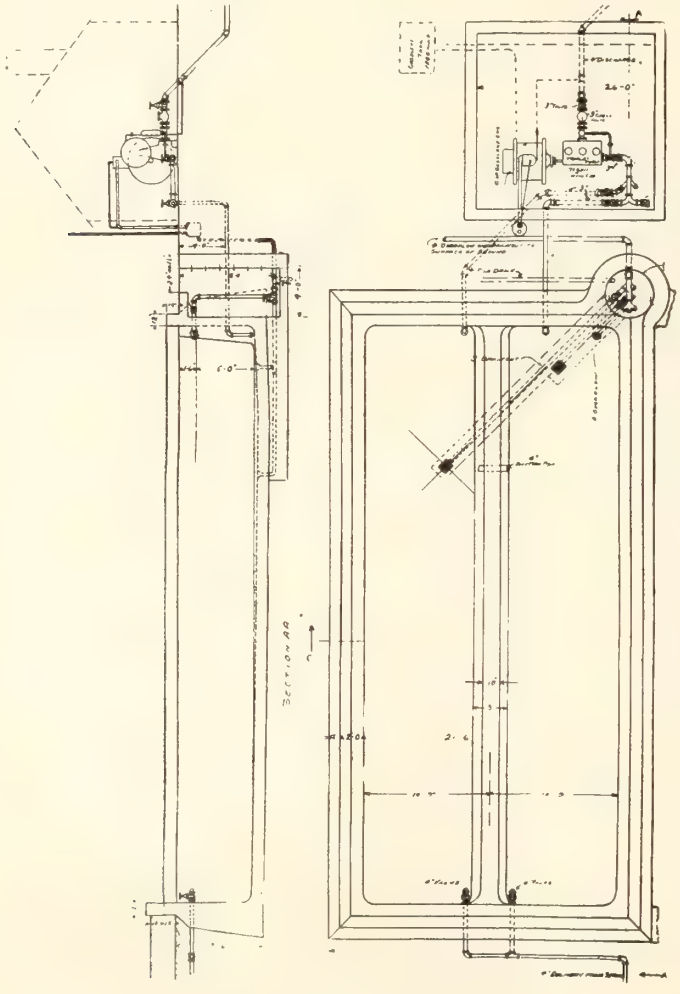


Fig. 2—Plan of Storage Reservoir.

From the spring enclosures are run 2-inch valved delivery pipes, which unite with a 4-inch pipe leading to the receiving reservoir. The valves on the delivery pipes are all brass, gate valves, placed in spring enclosure at an accessible point.

The receiving reservoir is of the dimensions shown on the plans and is built of concrete bottom, with sides of rubble masonry laid in Portland cement mortar. It has a storage capacity of 36,090 gallons. The inside and outside of this reservoir are plastered with mortar, troweled hard and smooth. The inside surfaces are, in addition, coated with cement grout over the mortar, thus making the reservoir completely water-tight. This reservoir is finished with a wooden roof structure, anchor bolts being built into the top for the plate. The reservoir contains two divisions, which are provided with 4-inch valved inlet and 3-inch valved drainout pipes. The drainout pipes are connected with galvanized iron frames and hinged galvanized iron strainers set in the bottom of the reservoir, which is dished to drain to the strainers. A 3-inch overflow pipe is also provided for each division, which connects with a 4-inch pipe discharging on the surface of the ground.

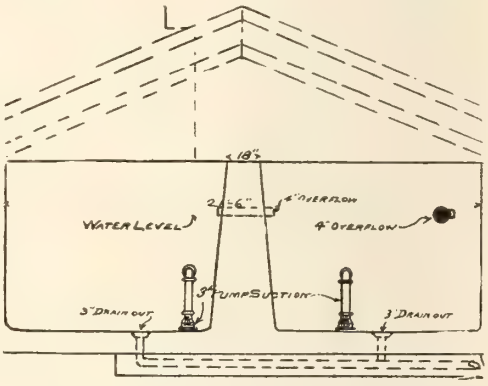


Fig. 5—Cross Section of Storage Reservoir.

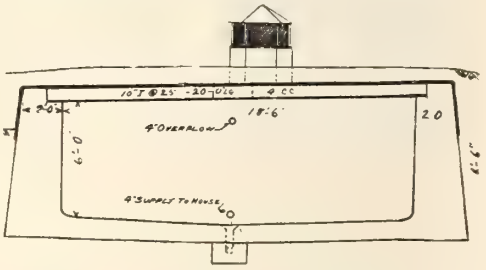


Fig. 6—Cross Section of Supply Reservoir.

The drainout and overflow pipes are wheel handles. The d*ainout valves are iron body, brass mounted, and have wheel handles. The drainout valves are placed in an accessible manhole, having wrought iron steps built into the walls and finished with a 24-inch heavy cast

iron frame and cover. Each division of the receiving reservoir is connected by a 4-inch valved suction pipe with a single-acting triplex pump located in an adjoining pump house. The suction valves are also located in the pump house.

The pump is direct-connected with a 6-horsepower vertical gasoline engine, and is capable of delivering 75 gallons a minute from the receiving reservoir into the distributing reservoir.

The distributing reservoir, which has a capacity of 19,250 gallons, is constructed in a similar manner to the receiving reservoir. It is covered with hollow brick flat arches supported on 10-inch steel I-beams, set on 4-feet centres, with 7-8-inch rods every six feet in the length of each beam.

Over the hollow brick is laid 4 inches of concrete, plastered on top and troweled smooth, and finished water-tight with coal-tar pitch, swabbed on hot, and carried below frost line on the side walls. Three hexagonal ventilating shafts are built in the roof over the reservoir, and finished above grade with concrete curb and hexagonal pyramid top with heavy guard wire sides, covered with copper mosquito wire.

The under side of the roof is plastered with cement mortar, troweled smooth, completely covering the under side of the iron beams.

Each division of this reservoir has a 3-inch valved pump discharge, a 4-inch overflow, a 3-inch valved drainout and a 4-inch valved supply connecting with the supply main to the house.

The reservoir has access pits, as shown on the plans, with wrought iron steps built into them, and with cast iron manhole frames and covers.

All of the supply pipes are galvanized wrought iron and have iron body, brass-mounted gate valves with wheel handles. The overflow and drainout pipes are extra heavy cast iron pipes with leaded joints.

The pipe mains consist of a line of 3-inch galvanized wrought iron pipe running from the pump to the distributing reservoir. The pipe crosses under a brook, where it is laid with the centre of the pipe at least 4 feet 6 inches below the bottom of the channel, and for a distance of 20 linear feet it is buried in concrete 6 inches thick all around the pipe.

At the lowest point on the main, a 2-inch brass drainout gate valve is provided, with a 2-inch pipe extended downstream and discharging into the brook. This valve is located in a masonry access pit, carried to the surface and finished at grade with a heavy cast iron manhole frame and cover.

At each summit on the 3-inch main there is placed a T, having a 1-inch compression valve, to serve as an air relief. These valves are placed in masonry access pits, with heavy cast iron frames and covers at grade.

A 4-inch galvanized wrought iron supply main is laid from the distributing reservoir to the house. This main has branch connections to fire hydrants.

All of the water pipes are laid with the centre of the pipe not less than 4 feet 6 inches below the finished grade.

Fittings and valves used on the discharge of the pump are flanged; other fittings are screwed.

The accompanying illustrations are from plans made by the supervising engineer of the work, Albert L. Webster, C.E., New York.

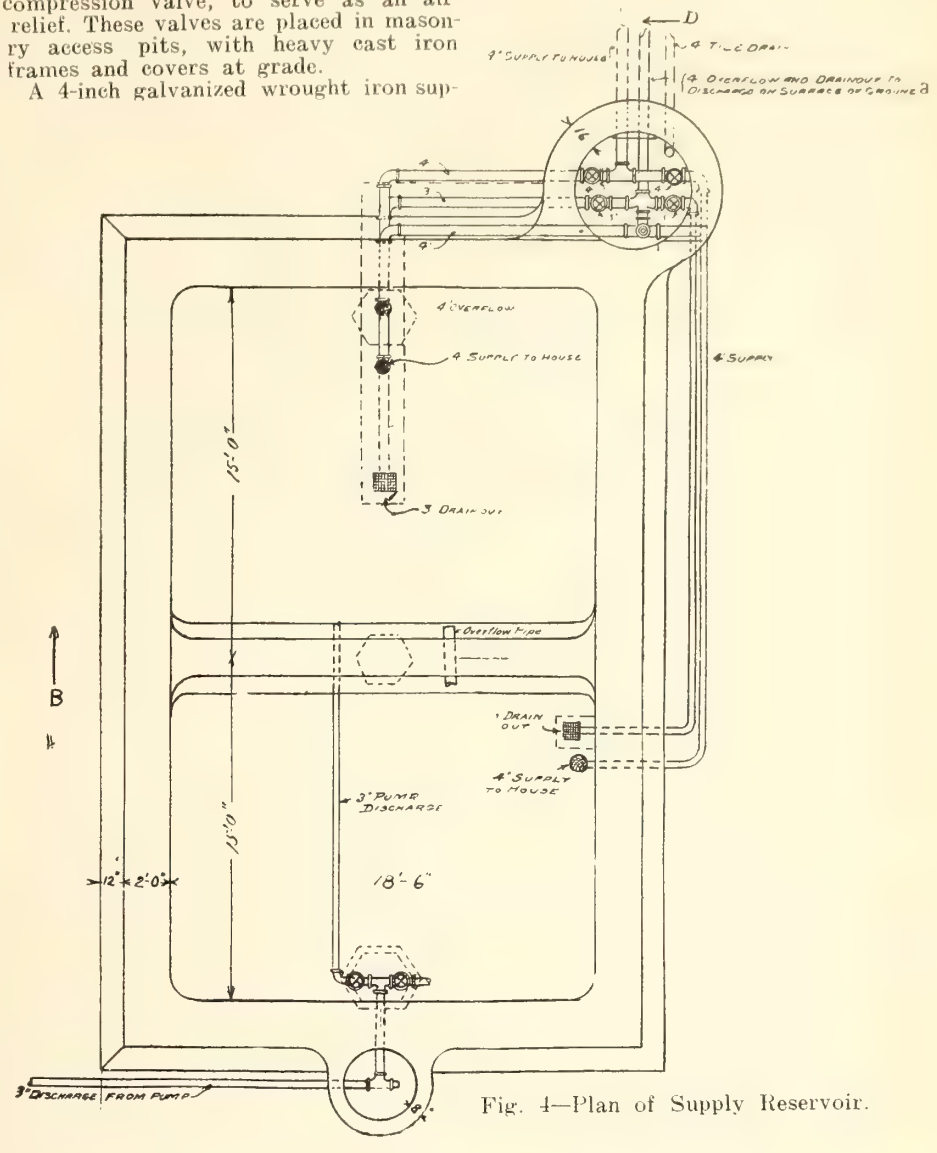


Fig. 4—Plan of Supply Reservoir.

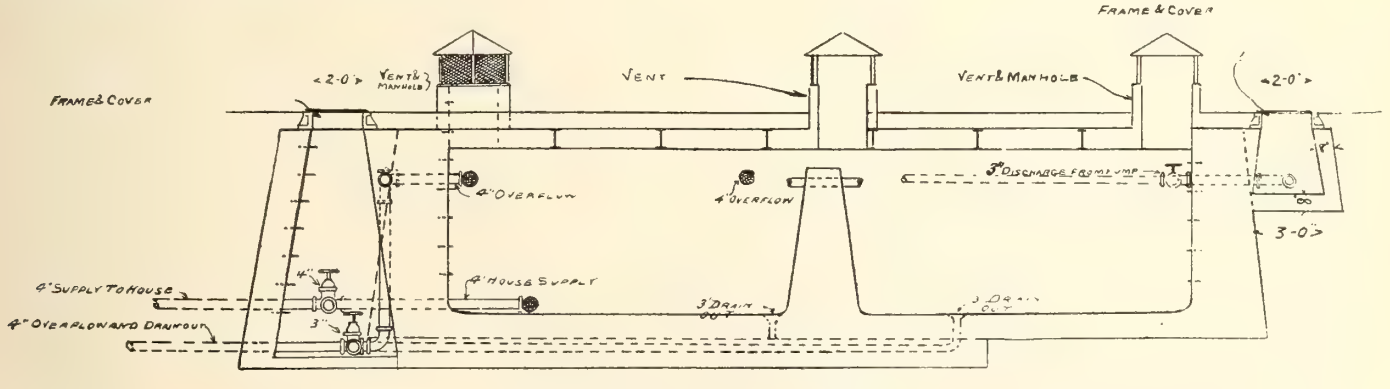


Fig. 3—Section of Supply Reservoir.

CHIEF MAGISTRATE RETIRES.

Mayor Andrew Riddel, St. Catharines, Ont., intends retiring from the chief magistracy at the close of his present term. It is rumored among his brother plumbers that he will seek parliamentary honors.

PLUMBER AND STEAMFITTER OF CANADA

The MacLean Publishing Co.
Limited

JOHN BAYNE MacLEAN - - - - President
W. L. EDMONDS - - - - Vice-President
H. T. HUNTER - - - BusinessManage
WESTON WRIGLEY - - - Managing Editor

Publishers of Trade Newspapers which circulate in the Provinces of British Columbia Alberta, Saskatchewan, Manitoba Ontario Quebec Nova Scotia, New Brunswick, P. E. Island and Newfoundland

OFFICES:
MONTREAL - - - - - - 232 McGill Street
Telephone Main 1525
TORONTO - - - - - - 10 Front Street East
Telephones Main 2701 and 2702
WINNIPEG - - - 511 Union Bank Building
Telephone 3726
LONDON, ENG. - - - - 88 Fleet Street, E.C.
J. Meredith McKim
Telephone, Central 12960

BRANCHES:
CHICAGO, ILL. - - - - - 1001 Teutonic Bldg.
J. Roland Kay
PARIS, FRANCE - Agence Havas, 8 Place de la Bourse
MANCHESTER, ENG. - - - 92 Market Street
ZURICH, SWITZERLAND - - - Louis Wolf
Orell Fussli & Co.

Subscription, Canada and United States, $1 00
Published Twice Every Month

OFFICERS OF NATIONAL MASTER PLUMBERS' ASSOCIATION.

Past President—F. G. Johnson, Ottawa.
President—John Watson, Montreal.
Vice-President—Joseph Laurier, Montreal.
Secretary—H. A. Knox, Ottawa.
Treasurer—Harry Mahoney, Guelph.

Provincial Vice-Presidents—
Ontario—Charles Taylor, Brantford.
Quebec—J. E. Walsh, Montreal.
Nova Scotia—F. Dexter, Truro.
New Brunswick—H. Dryden, Sussex.
Manitoba—A. J. Hammond, Winnipeg.
Alberta and Saskatchewan — E. J. Young, Calgary.
British Columbia—Bert Weeks, Vancouver.

Chairmen of Committees—
Legislation—H. J. Chandler, Ottawa.
Apprenticeship—J. A. Thibeault, Montreal.
Sanitary—L. Legrow, Toronto.
Essay—G. A. Wootten, Halifax.
Organization—H. McCauley, Montreal.

PERSONAL ADVERTISING.

Probably one of the best forms of advertising master plumbers' and heating contractors can adopt is to commend the quality of their own work. When a good job is done—and in plumbing and heating all work should be the highest possible—the attention of the customer should be drawn to the strong points of the job. Show how the work could have been done cheaper, but point out that it is better to have a pleased customer than a little extra profit. The average customer will be pleased, and when opportunity presents itself will urge his friends to have their plumbing and heating done by the man who had given him such good work.

A case in point recently occurred where a Toronto master plumber did a nice bathroom job and being pleased with its appearance drew his customer's attention to the work, showing how it could have been done a little cheaper without the knowledge of the customer. He had charged for a first-quality bath and showed how he could have installed a second without detection. About a month later a contract for six houses was given the master plumber as a result of a recommendation made by the customer who had been favorably impressed with the high quality of work done in his own house.

It pays to talk quality.

NEW WHOLESALE CENTRES.

Portage la Prairie and other Western towns and cities having laudable ambitions to become wholesale centres of importance, have recently been urging upon the Railway Commission the unequality of freight rates in the West, contending that there is discrimination in favor of Winnipeg. The Portage la Prairie Board of Trade presented a strong case before the Commission last month, asking to be placed on an equality with Winnipeg as a wholesale centre. The secretary of the Board and several of the leading business men of Portage la Prairie appeared before the Commission, and the whole question was argued at length. The decision of the Commission has not yet been announced, but there are well authenticated rumors that the requests of the ambitious Western city will be granted almost in their entirety.

Whether this be true or not, there can be no doubt that it is only a question of time until many of the Western cities must be given advantageous through and distributing rates which will permit them to become important wholesale centres. Winnipeg has been the first Western wholesale centre of importance, but the country is too big to allow it to have a monopoly. In the Far West there are several cities of importance already. Calgary, Edmonton and Regina are rapidly growing in importance as wholesale centres, and they will have many rivals.

ORGANIZATION REQUIRED.

Some time ago this paper drew attention to the good work being done by the American Society of Heating and Ventilating Engineers, a body which comprises in its membership most of the representative heating authorities in the United States. It was urged that the heating men of Canada, particularly those employed as salesmen for the manufacturers and supply houses, should get together in an organization, the object of which would be to deal with the heating problems peculiar to this northern country. Already there are several members of the American Society in Canada and these could form a nucleus for a branch of that body in this country. The Heating and Ventilating Magazine for October favorably commented on the proposal, as follows :

"A proposal has been made by the Canadian heating trade paper urging an organization in Canada of heating and ventilating engineers and recommending that such an organization affiliate itself with the American heating engineers' society as a chapter of the latter organization. One of the things that has brought this matter to the minds of Canadians at this time is the fact that the recent summer meeting of the American society was held at a point close to the Canadian border. The other factor was the recent meeting in Montreal of the National Association of Master Plumbers, Steam and Hot Water Fitters of Canada. At the Montreal convention the brilliant prospects for the future of the heating profession in Canada were evident to a marked degree ; the growing opportunities for Canadian business have for some time been an important factor in the plans of the more progressive American manufacturers of heating goods. The fact that Canada is at present without a representative organization of essentially heating and ventilating men is not in keeping with the Dominion's requirements or opportunities in this direction."

Readers who favor the organization of the heating salesmen in Canada are invited to forward their names to the editor or to send an expression of their views for publication in The Plumber and Steamfitter.

DISEASE CAUSED BY CEMETERIES

San Francisco is said to be suffering from its cemeteries, which are, as it happens, now placed on hills, to the windward of the main portion of the city, in such a position that the trade winds from the Pacific, which blow for two months of the year, bring down among the living whatever miasma may rise from the sepulchres of the dead. A large school-house, situated near one of the cemeteries, was recently closed, on account of the repeated outbreaks of diphtheria among the pupils, and some of the physicians of the city attribute these as well as other troubles from zymotic diseases, to the air from the graveyards.

We do not remember having heard diphtheria before attributed to cemetery exhalations, but it is quite possible that it might be caused by them, and the people of the city are quite justified in urging, as they are now doing, the prohibition of further interments within

the city limits, and even the removal of the bodies from the cemeteries already existing. Although the latter would be a rather serious undertaking, it is not likely that diphtheria will diminish much until it is accomplished. Few people have any idea of the time during which noxious and corrupting substances buried in the ground beyond the reach of the nitrifying microbe, will continue to saturate the earth, and the surrounding atmosphere, with foul vapors. It is commonly assumed that within a few months, or a few years, at the utmost, the products of decomposition are absorbed by the soil, and converted into harmless inorganic substances ; but Professor Lanciani tells us that under his direction, trenches were dug in the gardens of Maecenas, which were made about the year 40 B.C. by filling in twenty-five feet of clean soil over an old cemetery on the Esquiline hill in Rome. The cemetery had long been a nuisance and danger to that part of the city, and Maecenas earned the gratitude of his contemporaries by buying it, and covering it up. Nevertheless, after two thousand years of disuse, and exposure to such purification as a good covering of clean soil could effect in it, Lanciani found it necessary, when his men had reached the bottom of the earth-filling, and exposed the ancient surface, to relieve them at short intervals, in order that they might escape suffocation from the stench which proceeded from the remains of the people whose bodies were laid there long before the Christian era.

MISTAKE MANY RETAILERS MAKE

A number of complaints have been made recently by jobbers at the growing laxity on the part of the retail trade in signing railroad receipts. Many a retailer sends his carter to the railroad station for a shipment of goods without impressing on him the necessity of checking the number of pieces and examining the condition of the packages before signing any receipts. The result is that in a number of cases a carter signs the receipt before he obtains the goods. Probably no check is made by the merchant himself for some days. When he finally does do it and discovers an error he immediately writes the jobber to the effect that he is short a number of pieces or that the goods are damaged. When questioned in regard to the receipt given to the Transportation Company he endeavors to be evasive and hints at the withdrawal of his custom unless the claim is settled to his satisfaction.

"A very pretty piece of business," one might exclaim, but it is surprising the number of cases that occur. A retailer would have a very poor opinion of himself or staff if, when a sale of $25 was made, $24 were accepted as a settlement, $4 of which was bad money. Yet, there is an analogy between a merchant who would do that and one who signs for something which he did not receive.

The manufacturers and jobbers in the United States have had so much experience along these lines that they will not recognize any claims of this nature, throwing the onus where it belongs—to the man who signed for the shipment. Nearly every invoice received from the United States has a slip attached bearing this inscription:

IMPORTANT.

Before accepting and receipting for the material called for by bill of lading herewith, please see that you get the correct number of packages and that they are in good condition.

If the shipment is "short" or the packages broken or damaged so as to expose contents to the weather, do not give the railroad company your receipt until after the station agent notes condition of the shipment on your expense bill.

If you accept shipments from the railroad company "short" or damaged, you do so at your own risk.

Many merchants in Canada are stamping their invoices with a similar notation, and the larger firms refuse to entertain claims for loss or damage unless a proper receipt has been given to the transportation company.

In times like these, when the transportation facilities of the country are overtaxed, it behooves every retail merchant (especially those engaged in the hardware and metal trades) to make a strict check of all their shipments. It is one of the most important details of business.

COST OF SCHOOL HOUSE HEATING

An inquiry into the cost of school house heating and ventilation is begun in an article on another page in this issue. This is an important subject regarding which information is limited and with the assistance of readers of The Plumber and Steamfitter, some valuable data will be gathered which will undoubtedly prove valuable to all engaged in contract heating and ventilating work.

In many of the United States, notably Massachusetts, New York, New Jersey and Pennsylvania, the importance of ventilation is recognized, compulsory laws being in force governing the nineteen or twenty millions of people in these states. Health and comfort are essential to the school building as the rising generation has enough disadvantages to overcome without being forced to spend hours each day in an atmosphere lacking the essentials necessary to the proper development of their bodies.

Nearly every winter brings reports of schools in many districts being closed owing to inadequate heating facilities, so every village, town and city is interested in the problem of the adequate heating and ventilating of school buildings. Amongst the subjects of general interest, therefore, is the fuel consumption by different methods and the ventilation maintained by the apparatus in use.

Maintaining the proper degree of purity of the air is more essential and costly than maintaining the temperature of the air in the rooms, but heating is too often done at the expense of unsanitary conditions due to improper ventilation. Experiments carried on a few years ago at Columbia University showed that the change of air that was necessary to maintain the air in school and lecture rooms at the required standard of purity to be fit to breathe cost approximately as much as if the air was not changed at all. It is clearly evident, therefore, that fuel cost is not the whole question if ventilation is good.

The various phases of the problem of heating and ventilating school buildings will be discussed in the series of articles to be written by Mr. Oldacre, but to make the inquiry as complete and valuable as it should be, the co-operation of the progressive thinking men in the trade is requested. Every dealer can, upon a little investigation, secure the information asked for in the following questions, replies to which the editor of The Plumber and Steamfitter requests :

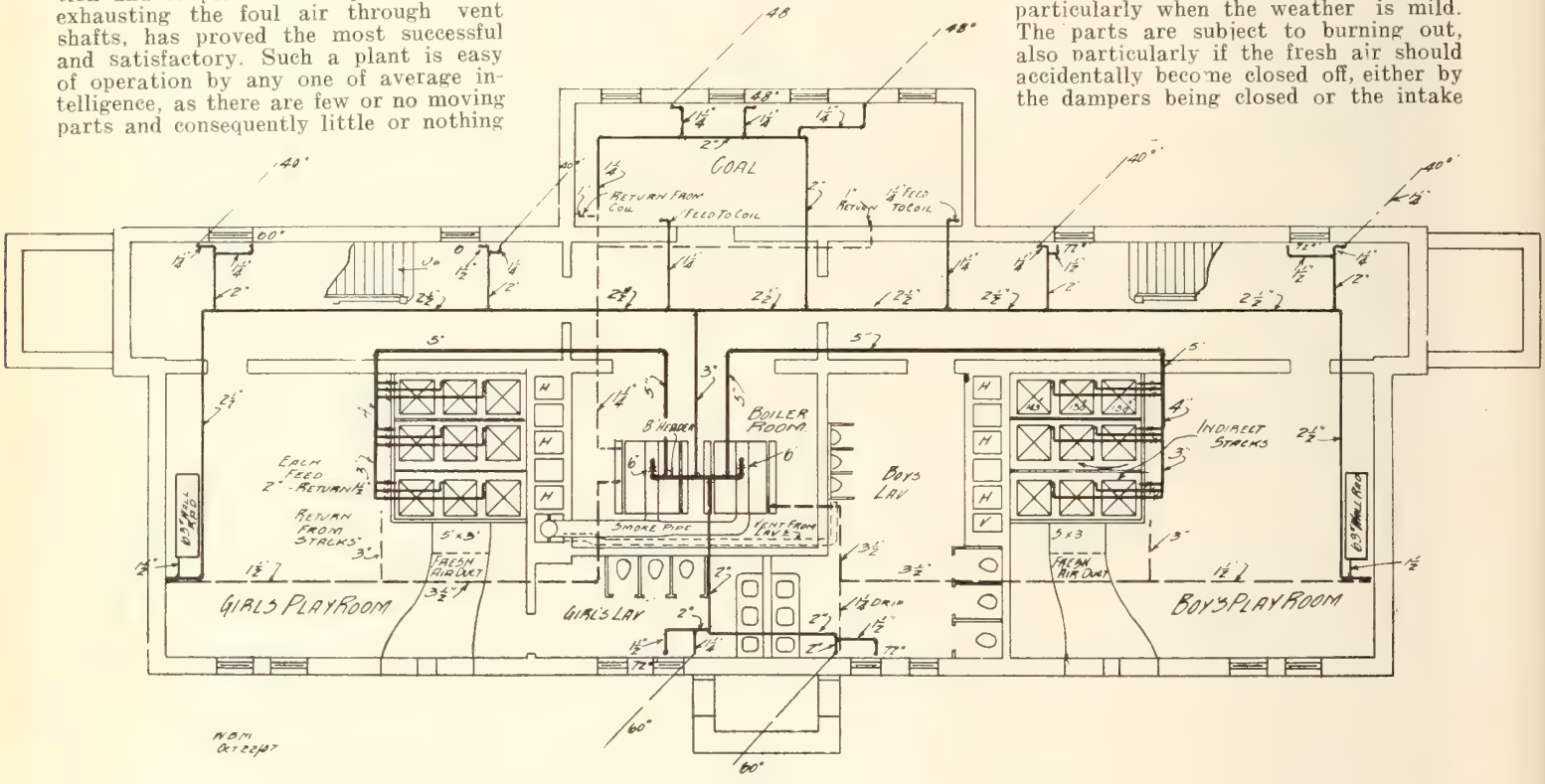
Name .....
Town .....
Province .....
No. of School Rooms .....
Size of School .....
Size of Assembly Hall .....
Character of Construction .....
No. of Months Heated .....
Lowest Prevailing Temperature .....
Method of Heating .....
Degree of Satisfaction .....
Tons of coal burned during heating period .....
Has school been dismissed owing to inadequate heating facilities .....

Heating and Ventilating School Houses

The first of a series of articles by C. E. Oldacre, member American Society H. & V. E. Toronto—
Sketches by W. B. Mackay, Toronto

Probably nowhere has heating and ventilation received as much attention from the general public as in connection with the proper heating and ventilating of our schools. Heating engineers have for years diligently applied themselves to solving the various problems arising under various conditions and we to-day have at our command good and effective means of properly heating and at the same time properly ventilating our schools.

For moderate-sized school buildings it has been generally found that a low pressure gravity system of indirect heating, supplemented by direct radiation and coupled with ample means for exhausting the foul air through vent shafts, has proved the most successful and satisfactory. Such a plant is easy of operation by any one of average intelligence, as there are few or no moving parts and consequently little or nothing to get out of repair. Durability is another feature of such a system not possessed by some other methods.



Basement Plan for Indirect Heating of School House.

An English Illustration.

Illustrative of the durability of steam and hot water heating apparatus, we may cite the warming and heating installation of St. George's Hall, Liverpool, designed by Dr. David B. Reid, concerning which Charles B. Honiball says in a paper read before the British institution of Heating and Ventilating Engineers, London, October 8, 1907 :

"The installation has been in constant work since the opening of the Assize Courts in St. George's Hall in 1851 and 1854, respectively, and it is working to-day. It has proved entirely successful in working, without occasioning any difficulty at any time. Though it may lack modern labor-saving devices, it possesses many, if not all, the essential features that characterize successful installations of to-day, which is the more remarkable when we consider the position mechanical ventilation occupied during the period of the design and erection of the plant (1841-1851). Viewed scientifically, the building is an immense pneumatic machine, kept in operation according to the necessities of its occupation. When the building is unoccupied, the air courses freely through the cold and warm air chambers, halls, courts and corridors, to the extremities of the building, when it returns to its central course to be again dispersed. But with the building in occupation, the order is different ; the air then becomes contaminated and is discharged, and the supply and discharge are proportioned to the extent of contamination. The building is 490 feet long and 165 feet wide, and covers an area, including the approaches, of 3½ acres.

Systems for Large Buildings.

In large buildings a blown or mechanical system of supply and exhaust, or a combination of fan supply and gravity exhaust is generally used. Either of these may be supplemented by direct radiation, as with the gravity system.

Furnaces in times past have been used with more or less success and though they have done the work as far as the heating was concerned, in few cases have they proved satisfactory when the ventilation, which is one of the most important factors, is taken into consideration. Though furnaces are the cheapest to install, in first cost, they are not the cheapest to maintain from the standpoint of fuel consumption, or from the point of up-keep and replacement.

In moderate or large-sized schools, furnaces are hardly to be considered on account of necessitating too large a number of fires, as in no case can even the largest furnace care for more than two standard-sized schoolrooms (28 ft. x 32 ft. x 12 ft.). Excessive firing in very cold weather is likely to warp or crack the parts and result in leaky joints emitting coal gas into the rooms, particularly when the weather is mild. The parts are subject to burning out, also particularly if the fresh air should accidentally become closed off, either by the dampers being closed or the intake becoming banked up with snow during a snowstorm.

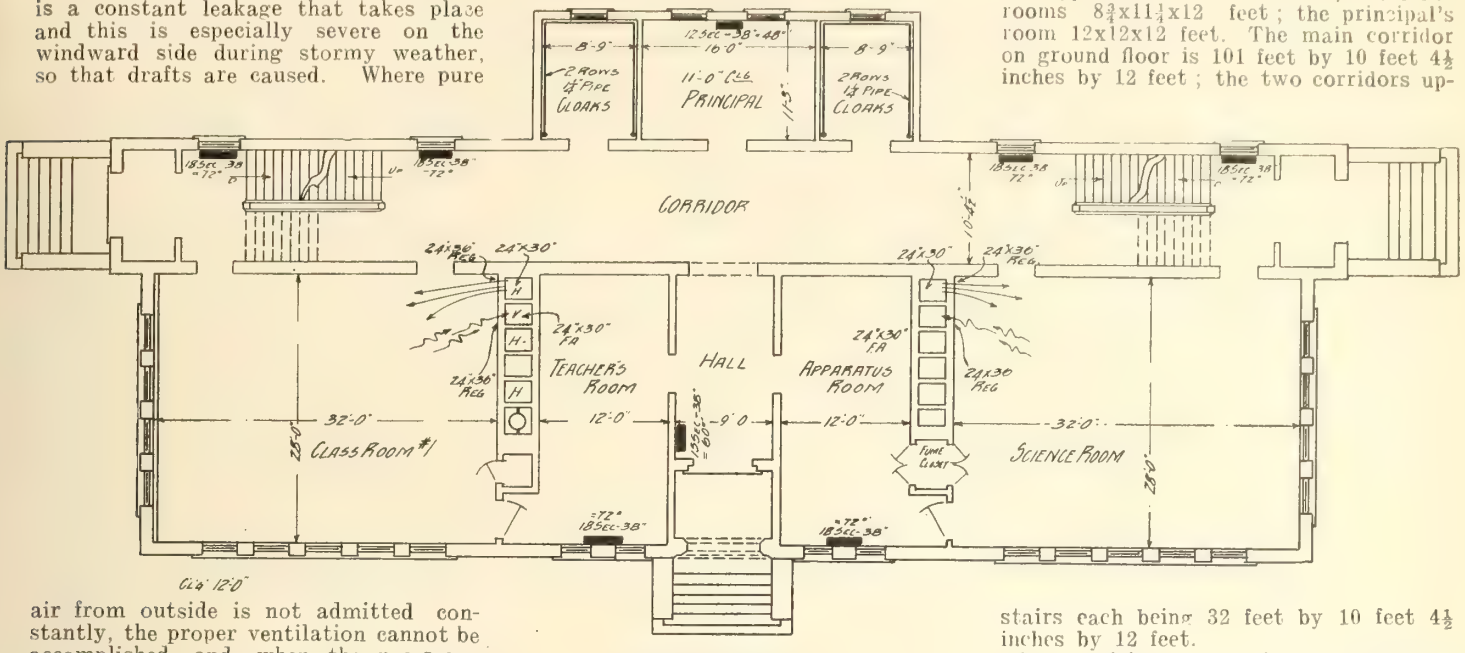
Unwise First Cost Savings.

Thousands of dollars have been expended on heating and ventilating plants for schools from a desire to save in the first cost. Many failures in indirect heating have been caused by providing insufficient radiation and by too small heating and vent shafts causing the air to be brought in at too high a velocity or else an insufficient volume of air to provide the necessary ventilation and maintain the air at a proper standard of purity.

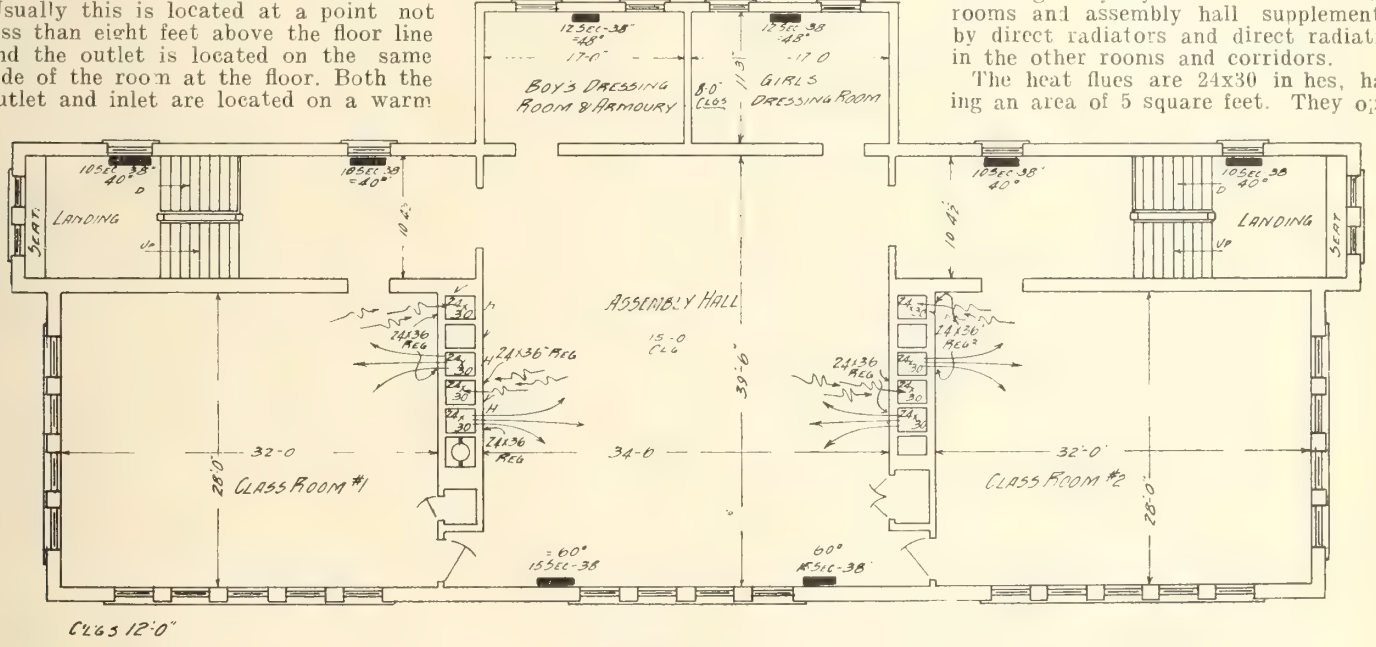
In many cases the heating has been accomplished solely by direct radiators located in the rooms, together with vent shafts of various dimensions. In some cases these vent shafts have not been

provided either with stack heaters or aspirating coils to heat the stacks.

The result of such work has been faulty ventilation and drafty rooms. When ventilation is tried to be used with direct radiation only in the rooms the results cannot be successful. Through and around all doors and windows there is a constant leakage that takes place and this is especially severe on the windward side during stormy weather, so that drafts are caused. Where pure air from outside is not admitted constantly, the proper ventilation cannot be accomplished, and when the necessary air is admitted to rooms it can only be done by the incoming air being raised to a temperature 20 to 30 degrees higher than the temperature desired in the rooms—usually 68 to 70 degrees. The air inlet for the heating and ventilating should be near the top of the room. Usually this is located at a point not less than eight feet above the floor line and the outlet is located on the same side of the room at the floor. Both the outlet and inlet are located on a warm wall. Experience has shown that this gives the best distribution of the air and affords in every way the most satisfactory results.



GROUND FLOOR



FIRST FLOOR

System for Four-room School.

In the illustration is shown a four-room school, two storeys high, having four class rooms, an assembly hall, principal's room, teachers' room, laboratory or apparatus room, cloak rooms, a main corridor and a side corridor. In the basement, which has a 10-foot ceiling, are located waiting or play rooms, lavatories, boiler room, coal room and the principal part of the heating apparatus. Each school room is 28x32x12 feet, with accommodations for 49 pupils and the teacher, or 50 occupants. This gives a total cubic air space in each room of 10,752 cubic feet, without taking into consideration space occupied by furniture and occupants.

The total floor space is 896 square feet which gives 17.92 square feet of space per occupant, when occupied by 50 persons, or 20.24 square feet of floor space for each person when occupied by 40 persons.

Lighting is provided by windows on two sides of the rooms, extending from close to ceiling down to within three feet of the floor.

The assembly hall is 36 feet 6 inches by 39 feet 6 inches, and has a 15-foot ceiling. The total cubic contents of this room is 216,225 cubic feet.

The teachers' room is 12x28x12 feet,; the apparatus room 12x28x12 ; the cloak rooms $8\frac{3}{4}$x$11\frac{1}{4}$x12 feet ; the principal's room 12x12x12 feet. The main corridor on ground floor is 101 feet by 10 feet $4\frac{1}{2}$ inches by 12 feet ; the two corridors upstairs each being 32 feet by 10 feet $4\frac{1}{2}$ inches by 12 feet.

The waiting rooms in the basement have 10-foot ceilings, and are lathed and plastered, and the boiler room is metal lathed and plastered.

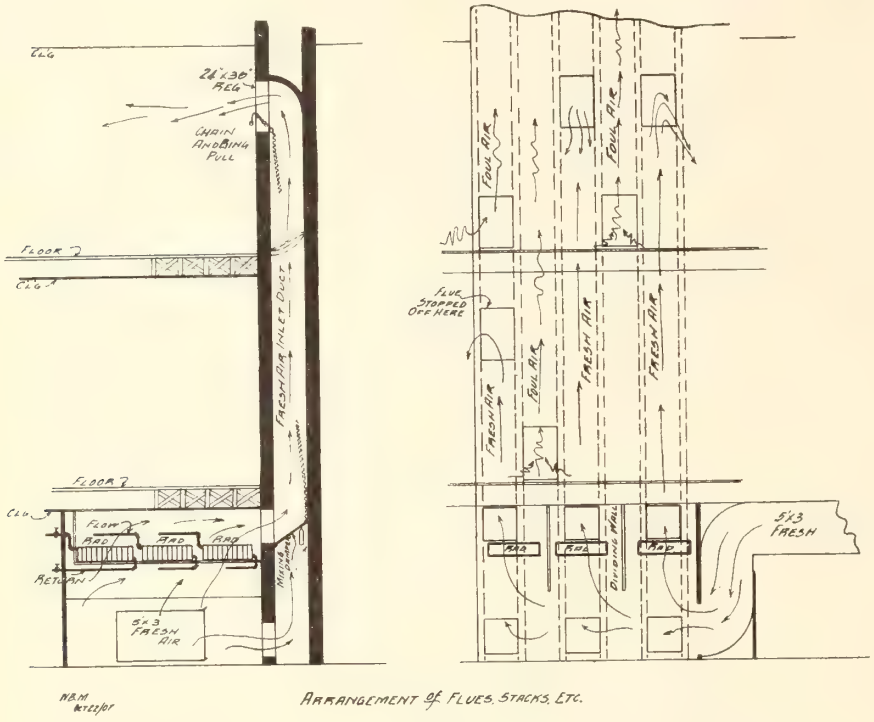
Indirect Gravity System.

The heating and ventilating is the indirect gravity system for the schoolrooms and assembly hall supplemented by direct radiators and direct radiation in the other rooms and corridors.

The heat flues are 24x30 inches, having an area of 5 square feet. They open into the rooms 8 feet above the floor line, and the outlet is provided with wire grills. Each duct is also provided with a mixing damper at the opening leading from the space over the indirect radiator stacks so arranged to admit warm or cold air, or cold and warm air at will in varying proportions to suit the conditions.

At the top of these warm air ducts

they are curved so as to easily change the direction of the flow from a vertical to a horizontal direction, thus avoiding friction. At the bottom of the stacks are openings 24x30 inches, communicating directly with the cold air room. The air is carried through the space between and around the indirect radiators, except



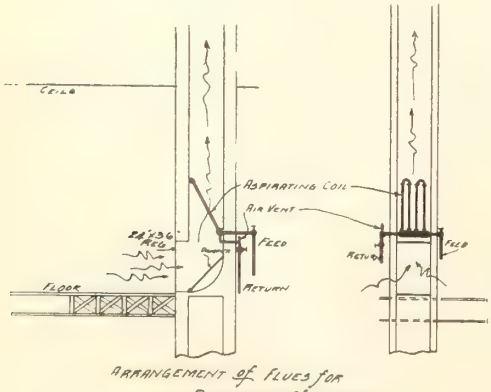
ARRANGEMENT OF FLUES, STACKS, ETC.

that the mixing dampers open when it passes more or less into the stack as the damper is less or more closed against this opening.

The damper is controlled by a short chain terminating at an adjustable catch close to the heat outlet. The outlets are covered by wire grills 24x36 inches, secured in a suitable iron frame. These provide for a much freer outlet of the air than do cast register faces, which often take up 30 to 40 per cent. of the area of the outlet.

Outside Air Valves.

Each warm air duct is provided with 390 square feet of cast iron indirect radiating surface, divided into separate parts of 130 square feet each. Each section is properly valved on both flow and return and provided with automatic air



ARRANGEMENT OF FLUES FOR DISCHARGE OF FOUL AIR

valves. These valves are located on the outside of the heating rooms. The walls around the heating stacks are of brick, strapped and plastered outside and cement finished inside.

The indirect radiators for each stack are divided into three sections, so that one, two or three sections may be used according to the varying outside temperatures, thus effecting a considerable saving in fuel and providing means of regulating the temperature of the air more readily. Each stack is separately supported on hangers of iron pipe. Each section is 36 inches long, 11 inches high, 3½ inches wide, and contains 13 square feet of heating surface—the pattern being one having extended surface. Each of the stacks are made up of 10 of these sections. Stacks so made up are to be preferred to coils made up of wrought iron pipe on account of cost and facility in erection though the latter may be more efficient per foot of surface.

Between each series of stacks leading to the various flues from the same cold air room there are placed galvanized iron of No. 22 guage for partitions. These partitions are carried down two feet below the bottom of the indirect radiators, but the space below the radiators is left entirely open to admit of a more equal distribution of the air to the radiators. The cold air room is connected to a duct provided with a tight-fitting damper, to the outside of the building. Over the opening in the wall is placed a galvanized iron screen of ½-inch mesh made of No. 14 wire.

Leading from the class rooms on the lower floors to the fresh air room, so that during school sessions the air may be rotated by closing off the dampers from outside and opening the ones in the inside connections and at the same time closing the dampers in the vent ducts, so a saving in fuel expense is made.

The foul air is removed at the floor level through wire grills 24x36 inches, leading into the vent stacks, which are 24x30 inches. Each opening is provided with a galvanized iron damper—this applying to ducts leading from class rooms only. Each stack has an aspirating coil containing 20 square feet, made up of wrought iron pipe. Each aspirating coil is properly valved on its flow and return and provided with an automatic air valve. The coils are supported on iron pipes about one foot above the opening into the vent stacks.

(To be continued.)

A TOO COMMON COMPLAINT.

No more disastrous affliction can come to a man than that commonly know as "swell-head." In business it has ruined thousands of men in the past, and, doubtless, it will continue to add thousands more to the number.

A tendency toward "swell head" is most unfortunate, not only for the employe, who shows signs of the approaching malady, but also for his employer; for, generally, it results in the employer losing what might have been a good and useful man in his business, and in the employe missing a good opportunity to do well for himself.

Generally, the first manifestation of the disease is a marked disposition on the part of the employe to consider himself indispensable to his employer. Gradually the victim assumes that he is the "whole thing," and that the business would wither and die if he should take it upon himself to leave. In the advanced stages of the affliction, such an employe grows impertinent, neglects his duties, sometimes lies, and often deceives his employer. He puts on a lot of airs, treats his employer's views and wishes with disrespect, and even goes to the length of actually antagonizing the man who hires him to

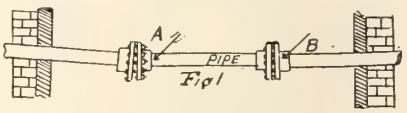


Fig. 1—Pipe reaching from one wall to the other

carry out his orders. At this stage the wise employer becomes a surgeon. He finds it necessary to cut the afflicted one off from the business, even though he may know that in so doing he is losing a man who has attained to a position of some importance. Large busi-

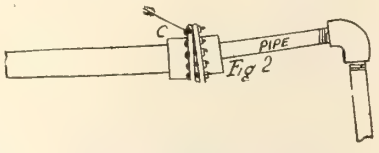


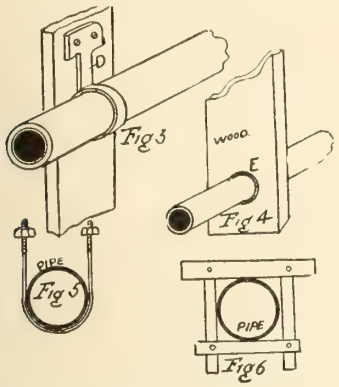
Figure 2—Defective installations due to lack of support underneath

ness houses usually make it a definite policy to dismiss the "swell-heads" as fast as they show symptoms of the disease. This should be a warning to those who feel the first approach of the well-known symptoms, so that when they suspect their heads are beginning to swell, even in the slightest, they may follow one of two courses—either hold the swelling in with a band, or hunt another job. Of course if the victim can check the malady with a bandage of his own winding, he will be doing a great service, not only to himself, but to his employer.

TRUSSING OF LAUNDRY PIPES

J. Keith Peters in the Plumbers' Trade Journal.

Sometimes a pipe has to be installed so as to reach from one wall to another as in figure 1, and lacking the proper support, settles in the centre, oftentimes to the extent of breaking open the lead joints. I have seen laundry pipes reaching across the street, so as to convey water or steam from one department to the other in the plant. When this is done, care has to be taken to properly support the line of pipe or springing



Figures 3, 4, 5, 6—Different ways of supporting pipe

downward and leaking joints will result.

Many excellent systems of pipe installations in laundry are non-effective for the reason that there are no middle supports. I have not only seen the pipes drooping as in figure 1, with leakages created at the joints A and B, but I have seen defective installation, as in figure 2, due primarily to the lack of the required underneath support. A line of piping carrying steam, hot water, cold water or gas in the laundry can be made to assume an exceeding stiff position, by securely tightening up on the joints, But it will not do to rely too greatly upon the flanges, the bolts, the thread unions and the like for stiffness. Supports are needed, otherwise your joints may open as at C, figure 2, due to the settling of the system. Therefore, in the modern laundry we find instances of perfect and imperfect trussing or supporting of lines of pipes by brackets, rods, struts, braces etc. Sometimes it is possible to get the required support of the pipe by using a wrought iron ring, constructed as exhibited in figure 3, and attached with lag screws to the woodwork as at D. Such a support can be manufactured from wrought iron by the smith of the establishment. Cast iron boxes of this design are made and can be purchased ready for use. The plan, however, is

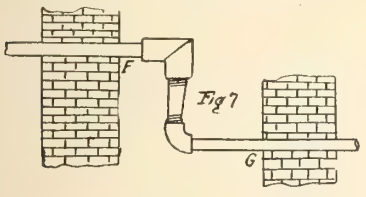


Fig. 7 Showing another way of relieving strain

feasible only in cases in which the system of pipe runs along the wall. In case that the pipe reaches from one side of a building to another, clear from any middle supports, it becomes necessary to contrive supporting devices of the most appropriate order. I noticed in some laundries that the middle braces were secured by utilizing wood brackets, one of which is exhibited in figure 4, In this type of bracket, a plain section of lumber about two inches thick is secured and cut about 8 inches wide. Then the hole is bored to harmonize with the diameter of the pipe. The pipe hole is marked e. The upper end of the brace thus acquired is fastened to the joists of the flooring overhead, or they may be secured to posts along interior of apartment.

Then another plan of supporting the line of pipe without actually resorting to the trusses, is shown in figure 5, in which a common round bar of iron is bent to the shape of an inverted staple. The ends of the "U" thus made are turned down with the proper-sized thread for receiving the nut as shown. Therefore the ends of the metal support may be inserted through holes cut through the flooring above, or in a post, or wall, and secured with the nuts and washers on the other side. The pipe is received in the "U" as illustrated. I noticed that instead of metal supports of this nature, some of the mechanical men of the laundries were employing home-made wood frame contrivances of the order exhibited in figure 6. In this frame, common pieces of hardwood are selected.

The square is made and then the pipe can be placed inside. This type of wood support is readily made and when strongly designed can be used with practicable results in supporting pipes. There are other instances in the installation of laundry pipes in which the plan is according to the diagram presented in figure 7. Here the strain is not upon any defined line of the pipe, not because of the "Z" form assumed, the supporting points at f and g result in a weakness at the elbows of the pipe. Hence pipes taking this line of position, ought to be centre braced to relieve elbow strain.

Figure 8—Sketch showing use of undertrusses

I find that there are two forms of trusses in use, namely, the under truss and the overhead truss. Some laundry engineers prefer the one and others the other. But much depends upon the prevailing conditions. There are instances in which the under truss, presented in figure 8, is preferred. Here the pipe runs from one wall to the other. The distance is so great between supporting points at the walls that the pipe will settle unless supported at central point.

The pipe proper is well adjusted in box bearings in the wall, which boxes are on the order of sleeves. These are cemented in the masonry and are substantial in every way. But without the middle support the pipe cannot retain its alignment and will settle, opening the lead joints and creating unnecessary leaking. Therefore the underneath truss is provided. The necessary wall bolts are constructed and put through the walls at h, h. The metal rod is joined and then the strut j is put in. Hence the middle support. A buckle should be used on the truss rods. You can make a buckle from an extended chain link, for light work. For larger trusses you will need to make a large, elongated link from inch iron, flatten the ends and bore for the points of the truss rods. Tap your thread in each of the bores of the buckle and cut kindred threads on the ends of the truss rods. Therefore you can take up and let out on the rods, and adjust the tension, by turning the buckle. Of course you will have to cut the threads "rights" and "lefts" in the buckle and on the corresponding rods.

While in figure 8 we show the underneath supporting rod truss, in figure 9 we present a diagram of the overhead

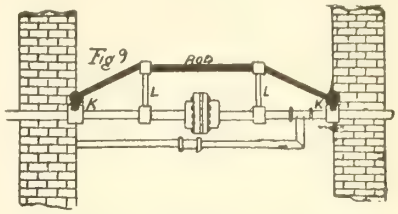
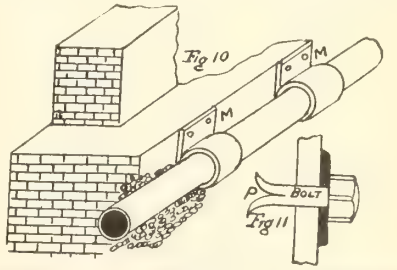


Figure 9—Diagram of the overhead supporting rod truss

supporting rod truss. In this case the conditions are practically the same. The principle of rods, buckles, and adjustment are employed, excepting that the rod and braces are on top instead of underneath the line of piping. The clamps used for securing the ends of the truss rods differ from the first example in the latter case that rods connect to metal clamps which are bolted securely to the body of the pipe at each end as at k, k. Then the rod is passed overhead to the position shown, with the braces of cast iron l, l, to support the same as shown. This is a lifting strain and the braces have to be bored out for the rod. The combination is chiefly for stiffening the system. It does not serve well to lift or support an extended line of sagging piping.

In figure 10 is another type of pipe supporting arrangement. It often occurs that the pipe runs outside the building near the ground. It is not desirable to place the line of pipe on the ground direct, therefore the line is adjusted in brackets of wrought or cast iron m, m, as demonstrated. I have seen bad work done with settings of this character, due to using defective adjusting screws. I have seen the boxes or supporting devices simply attached to the masonry by driving in screws or lugs. Sometimes the end of the bolt is split and reliance is placed upon the points expanding as



Figures 10 and 11—Other types of pipe supporting arrangement

shown at p and gripping within cement.

Sometimes the points will do this and again they will not. It is best to use bolts which pass completely through the work and can be secured on the other side with nuts, after plan exhibited in truss rod supporting bolts h, h, Fig. 8

SEPTIC TANKS FOR THE ROYAL MUSKOKA HOTEL

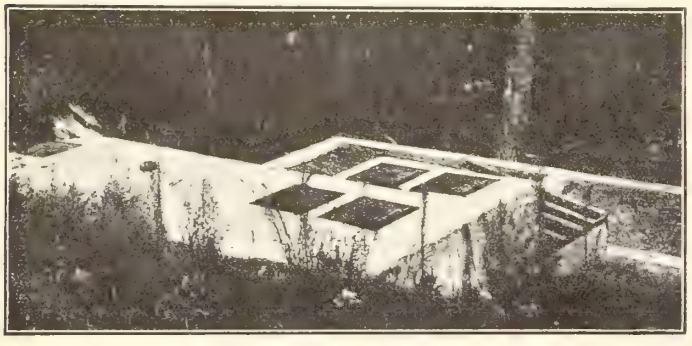
The accompanying illustration represents a section of a cottage and shows the installation of a system for the supply and distribution of cold water, the supply being pumped from a nearby well to a tank located in the attic.

The size of the storage tank depends on the number of people in the house. It is usually made large enough to hold one day's supply for the entire household, allowing from twenty-five to thirty gallons of water per person per day.

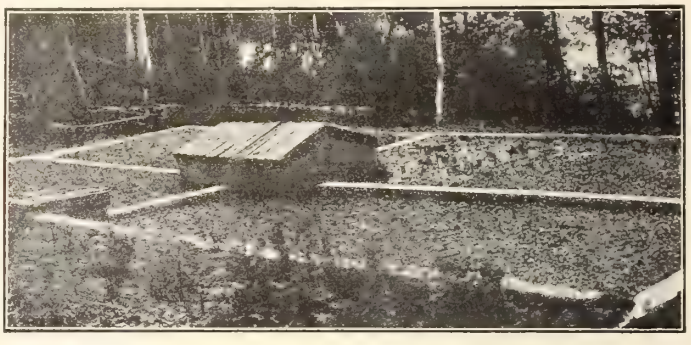
The main supply is run directly to the pump suction, and from the pump discharge a pipe is run directly to the tank. No branches should be run from the tank supply. From the bottom of the tank a down supply pipe is run and valved close to the tank so that it may be shut off entirely. From a point just below this valve a vent pipe is run as shown to permit of the down supply pipe being emptied when the valve on it is closed. From this down supply pipe the various distributing branches are run to each group of fixtures

The lowering of the float in the tank, as the water lowers, raises the chain which has two discs and a weight at the lower end. When it has raised sufficiently for the lower disc to raise the arm of the operating switch, a circuit is formed which starts the motor which operates the pump. In like manner the raising of the float as the tank fills with water breaks the circuit and stops the motor.

The overflow pipe runs from a point a little above high water level of the tank and discharges over a drip sink in the cellar. The safe waste empties into this overflow pipe. A gate-valved tank-emptying pipe also connects to the overflow pipe. This drip sink when possible should be located near the pump as an overflow or a leak is more likely to be quickly detected if the pipe empties within view of the pump.



Small Plant Showing Reinforced Concrete Roof.



Contact Beds of Large Plant Built in Concrete.

TORONTO'S SEWAGE PROBLEM.

Having met with success in its experiment with the septic tanks at the foot of Woodbine Avenue, in which is treated the sewage from the low-lying Kew Beach district, Toronto civic officials have at last come to an acceptance of a general plan, dealing with the sewage problem of the whole city, the proposal being to establish a system of septic tanks with bacteria beds, at the foot of Greenwoods Avenue, with the site running east to the Woodbine. About $2,500,000 will be expended on the plant, and $800,000 on the beds. It has also been decided that Toronto's water must be filtered, and filter beds will be established.

The Kew Beach disposal plant at Woodbine Avenue has been in successful operation since April. The sewage is brought into the tanks by means of two lift stations, the first one situated some distance east of the farm itself. This pumps the sewage to its level, whence it flows by gravity to the lift station at the plant, and is there pumped up into the tanks. These stations are equipped with four electrical pumps with a capacity of 450 gallons each per minute. The dynamos are regulated automatically, and they stop themselves when the tanks are full, resuming their labor as these are empty, thus working for perhaps ten minutes at a time, and resuming a little later. The pumps are more than sufficient to handle the amount of sewage coming through the mains at present, which has amounted to only about 200,000 gallons per day.

The tanks are of cement, three in number. The capacity is 65,000 gallons, and each tank is 100 feet long, 14 feet wide, and 7 feet deep. The sewage flows lengthwise through these continually, the solids settling to the bottom before the end is reached. Some tanks have partial partitions to aid in the retention of the solids, but this has not been found necessary at Kew Beach, as the tanks are very long.

The whole farm occupies about 23,000 square feet, the greater portion being taken up by the contact or bacteria beds, which are simply concrete tanks filled up with slag, which comes from Hamilton. In some cities coke is used, but it disintegrates. Slag is said to be best, and its length of service has practically no limit. There are in all twelve beds, of which only eight are at present in use. These are 50x28 feet, and 4½ feet deep. They hold about 20,000 gallons of sewage each.

Like most other things at the sewage farm, the filling and emptying of the contact beds is done automatically. There are three automatic valves, one for each four beds. When one bed has been full for two hours, it is automatically emptied and another one filled.

SEPTIC TANK AT EDMONTON.

Plans are being prepared for a septic tank to be established at Edmonton, Alberta, to treat the sewage now being emptied into Rat Creek and later into the river. Part of the trunk sewer is much larger than the rest and it is proposed to dam this part of the sewer and utilize a portion of the creek bed as a drying bed, there being no residents in the locality. The Provincial Department of Health has not yet ratified the proposal.

ROMAN BATHING.

It is probable that the Roman resorted to the baths at the same time of the day that others were accustomed to make use of their private baths. This was generally from two o'clock in the afternoon till the dusk of the evening, at which time the baths were shut till two the next day. This practice, however, varied at different times. Notice was given when the baths were ready by the ringing of a bell ; the people then left the sphaeristerium and hastened to the caldarium, lest the water should cool. But when bathing became more universal among the Romans this part of the day was insufficient, and they gradually exceeded the hours that had been allotted for that purpose. Between two and three in the afternoon was, however, the most eligible time for the exercises of the palaestra. Hadrian forbad any but those who were sick to enter the public baths before two o'clock. The thermae were by few emperors allowed to be continued open so late as five in the evening. Martial says that after four o'clock they demanded a hundred quadrantes of those who bathed. This, though a hundred times the usual price, only amounted to nineteen-pence. We learn from the same author that the baths were opened sometimes earlier than two o'clock. He says that Nero's baths were exceeding hot at twelve o'clock, and the steam of the water, immoderate. Alexander Severus, to gratify the people in their passion for bathing, not only suffered the thermae to be opened before break of day, which had never been permitted before, but also furnished the lamps with oil for the convenience of the people.

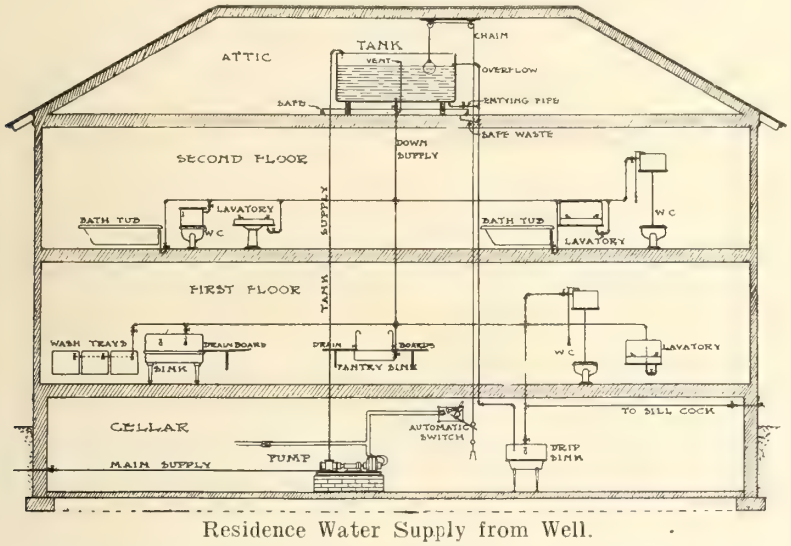
A very satisfactory pipe vise, writes P. O. Ward, can be made from a common steel vise by taking a piece of coarse sandpaper about 3 in. by 6 in. in dimension and after doubling it, place it around the pipe, then place the part with the sandpaper on it between the jaws of the vise and tighten. The pipe may then be either threaded or cut without difficulty.

RESIDENCE WATER SUPPLY FROM WELL

J. A. F. Cardiff in the National Builder.

With the introduction of the septic tank system of sewage disposal there is no longer any reasonable excuse for jeopardizing the health, and often the lives, of guests at summer hotels and similar resorts, through failure to provide safe and efficient methods of sewage disposal. It too often happens, however, that consideration of this important question is neglected until emphasized by the outbreak of an epidemic with its attendant loss of business and prestige.

Among the first to realize the importance of protecting their guests by adopting up-to-date sanitary methods is the well-known Royal Muskoka hotel, on Lake Rosseau, Ontario. The hotel is built on the southeast end of an island, and consists of twelve long wings; one extending northwest, the other southwest. The existence of a rocky ridge running east and west from the junction of these wings, made it necessary to provide two systems of sewers; one discharging south of the hotel, the other, and the larger system, being carried westward. The sewage from both systems is passed through septic tanks, and the tank effluents are subjected to aerobic bacterial contact before being discharged, odorless and clear, into the lake. Both plants were designed by the Cameron Septic Tank Company, of Chicago.



Residence Water Supply from Well.

The larger plant is designed to provide for a daily flow of sewage amounting to 25,000 gallons, and consists of two septic tanks and four aerobic bacterial contact beds, all built in concrete, and so arranged that either of the tanks can be cut out without interference with the operation of the other, thus allowing for various flows. The main sewer from the hotel discharges into an inlet chamber; from this chamber the sewage is admitted through sluice valves to each of the tanks.

The septic tanks are each 36 feet long, 7 feet wide and 3 feet deep below the water level, and are covered with reinforced concrete roofs. In the tanks the solids present in the sewage are separated and retained, and the organic matter is acted upon by the liquefying microorganisms present, by which it is broken down into simpler substances. The liquid effluent, thus freed from solids in suspension, passes off through a line of 3-inch pipes laid horizontally, 12-inch centre to centre, through a wall near the end of the tank, 2 feet below the water line, into the effluent chamber.

There are four contact beds, 29x15 feet, all filled to a depth of four feet with slag. The tank effluent is distributed over each contact bed by lines of farm tile laid in the filtering material and fed by main distributors. The filtered effluent is collected by lines of farm tile laid on the floor of the contact beds, discharging into main collectors. The latter are connected with cast-iron discharge wells in the gear chamber.

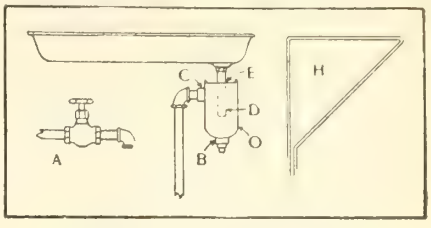
The tank effluent is delivered to each in turn through its admission valve. Meanwhile the discharge valve is closed so that the interstices of the filtering material are filled with the tank effluent. The effluent remains in the contact beds for a period of about two hours, according to the rate of flow, during which the impurities present in solution are oxidized by the bacteria attached to the surface of the filtering medium. The discharge valve is then opened, when the filtered effluent escapes, drawing down after it a supply of air into every crevice of the contact bed. The latter then drains and aerates, while the remaining contact beds of the set are filling, after which it is again filled in turn. This method of working renders the contact beds self-cleansing, so that they retain their purifying power unimpaired.

The alternate filling and emptying of the contact beds is effected automatically by means of the alternating gear, known as the central-basin four-filter gear. As soon as bed 1 is filled, a small quantity of filtered effluent overflows from its discharge well into a float chamber, lifting the float, at the same time opening the admission valve and closing the discharge valve of bed 2. When bed 2 is filled, this operation is repeated, the flow of tank effluent diverted into bed 3, and the discharge valve of bed 1 is opened, and its contents built upon a cast-iron bed plate and enclosed in a small chamber to protect it from the weather and from interference.

The works being automatic throughout and the working of the contact beds being controlled by apparatus of proved reliability, there is no risk of temporary breakdowns such as occur where the working of an installation is dependent upon the fidelity and vigilance of an attendant.

The small plant south of the hotel has a capacity of 5,000 gallons daily, and consists of one septic tank and three aerobic bacterial contact beds. The septic tank is 17 feet long, 6 feet wide, and an average depth of 5 feet below the water level. It is covered with a reinforced concrete roof and there are three contact beds averaging 15 feet long, 7 feet 6 inches wide, and all filled to a depth of 4 feet with slag. The method of operation is practically the same as already described for the larger plant, excepting that a three-filter alternating gear is used instead of the central-basin four-filter gear, above described.

Both plants have now been in operation two seasons, and are giving entire satisfaction.



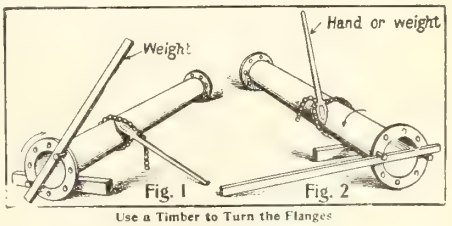
Sink Trap Made of Oil Can

HOME-MADE SINK TRAP.

J. Ellethorn, Toronto, writes in Popular Mechanics that the superintendent of a steam plant agreed to give the engineer a sink if he could find the necessary material to put it in place. For the faucets he used globe valves with a nipple and elbow, as shown at A in sketch. The sink trap was constructed out of an old oil can, O, leaving out the spout. A coupling was soldered in the can where the spout screwed in and a plug turned in the coupling, B. Another coupling was soldered in the can at point C and a pipe connected from this to the sewer. The can takes an inverted position, and the pipe, D, leading from the sink runs down into the can as shown, and is soldered at point E. Two brackets were formed by bending ½ by ¾-in. band iron, which made the supports, H, for the sink.

SCREWING FLANGES ON PIPE.

It is unnecessary to tie the handle of the chain tongs to a post. The practical way to arrange the pipe and tongs would be to place the tongs as shown in Fig. 1, so that they will hold the pipe from turning, and then allow the handle of the tongs to rest on the floor, using the timber to turn the flange, says a correspondent in the Metal Worker.



Use a Timber to Turn the Flanges

Another way would be to allow the end of the plank to rest on the floor, and the workmen could use the tongs to turn the pipe into the flange, the flange being held stationary by the timber, as in Fig. 2.

NEWS OF THE TRADE IN CANADA

H. H. Desautels, plumber, Montreal, has assigned.

Paris, Ont., will install a duplicate lighting plant.

Joseph Lamarche, plumber, Montreal has made an assignment.

The death occurred recently of Michael Kavanagh, plumber, Montreal.

Leonidas Vezeau has been registered to carry on a plumbing business in Montreal.

The Standard Valve & Fittings Co, Guelph, Ont., will soon enlarge their works.

T. McA. Stewart, representing T. McAvity & Sons, St. John, is in Montreal this week.

The new municipal power plant of Saskatoon, Sask., was put in commission recently.

C. G. McLaughlin, Latchford, Ont., is advertising a tinsmithing and plumbing business for sale.

W. R. Stavert, Montreal, manager of Jenkins Bros., valve manufacturers, Boston, has left on a trip to Fredericton, N.B.

A new system of steam heating, with radiators, is being installed in St. Luke's church, St. John, N.B., by E. N. Herrington.

John Peart, St. Catharines, Ont., has secured the plumbing contract for the new building being erected there by the Sovereign Bank.

The plumbing and gas fitting in the new Bank of Toronto building, St. Catharines, is the work of Samuel P. Gourley, of that city.

W. B. Clifton, Alliston, Ont., has sold his hardware and tinware stock to Mr. Scott. Mr. Clifton will continue in the plumbing and heating business.

Fire did about $200 damage to a stock of oakum at the warerooms of Somerville, Limited, 55 Richmond street east, Toronto, on Tuesday, Oct 22.

H. J. Fuller, president of the Canadian Fairbanks Co., Montreal, has left for a six weeks' trip to Europe, where he will combine business with pleasure.

Brown & Mitchell, Brandon, Man., have secured the contract for the steam heating of the new winter fair building to be erected in that city, the price being placed at $10,300.

The creditors of George A. McDonald, plumber, Toronto, met at the office of Osler Wade recently and decided to realize on the assets forthwith. The liabilities are $2,080 ; assets estimated at $1,070.

The London Brass Works Co., London, Ont., have purchased a ten-acre lot, on which they purpose erecting a large, up-to-date factory. It is unlikely that work will be commenced before next spring.

A contract for the heating and ventilation of a new school house to be erected in Kings county, N.B., has been awarded to the Sussex Mercantile Co. The H. H. Dryden Co. were successful tenderers for the plumbing.

The James Morrison Brass Manufacturing Company, Toronto, suffered about $2,000 loss in a small fire in its machine shop on Tuesday, Oct. 22. The loss was chiefly confined to patterns and tools, and is fully covered by insurance.

The Queen City Foundry Co., Toronto, has been incorporated with a capital of $40,000, to manufacture and sell boilers, hardware, ranges and locks. The provisional directors are: E. Gillespie, W. C. Burt, J. W. Clark, J. Brooks and R. J. Smythe, all of Toronto.

The P. Hymmen Company, Berlin, Ont., has been incorporated with a capital of $60,000, to take over the hardware and plumbing business of Peter Hymmen, Berlin. The provisional directors are: P. Hymmen, H. Hymmen and H. S. Hymmen, all of Berlin.

Joseph Lamarche, plumber, Montreal, assigned recently at the request of Geo. Hanratty, with liabilities of $14,000, and assets of about $1,600. The principal creditors are, Dame N. Lamarche, $6,000 ; Jas. Robertson Co., $2,181.25 ; Ed. Cavanagh, $1,800 ; J. O. Dion, $773,-65.

H. W. Burgess, of the Wallaceburg Brass & Iron Manufacturing Co., Wallaceburg, Ont., was a caller at the Toronto office of Plumber & Steamfitter last week. This young firm is getting a good share of business from the plumbing trade, as well as making a specialty of brass cocks for gas stoves.

Chadwick Brothers, brass manufacturers, Hamilton, Ont., have recently acquired a large tract of land adjoining their present premises. The business of this firm has been going ahead by leaps and bounds, and it is the intention to make a healthy addition to the plant in the near future.

A new steam heating apparatus has been installed at the Alms House, Norton, N.B. The job, which was done by the Sussex Mercantile Co., was rushed forward with commendable speed. The new heating system overcomes a difficulty which has caused considerable trouble to the commissioners.

Fred Armstrong & Company, Toronto, have been awarded the plumbing contract for the new Kent and Howard school buildings, the latter being the largest school in that city. The amount of the plumbing contract in each case was $1,050. The heating and ventilating contract in connection with the Kent school was also awarded to the same firm at $3,500.

A half-dozen employes for the Canadian Brass Works, Galt, Ont., arrived in that town from the United States recently. They are all married men with families, and have taken up their residence in Galt. The works of the company are very busy at present, and it is said there are sufficient orders on hand to keep the plant busy for six months.

The new municipal lighting plant for the town of Gravenhurst, Ont., was opened recently at South Falls, Ont. The plant cost $45,000, and consists of a 450 k.w. generator, driven by a water turbine of 750 horse power capacity. Power can be supplied to Gravenhurst, at a cost of $7 per horse power. This should be a strong inducement for in-

The statement of claim has been filed in the case of John Ellicot against the Hamilton Master Plumbers' Association. He alleges that before he was forced to become a member of the association he was unable to get goods to carry out his contracts, and he had to to turn them over to members of the association, with a loss to himself. Then he joined the association and paid a membership fee of $100. This money was not paid back to him when the association was disbanded after the prosecution of the members, and he asks for the return of it. He charges that the association had $1,500 on hand, out of which was paid the fine and costs of the criminal case, and the balance was divided among the members. He asks that he be paid his share of this money.

Plaide Lafiamboise, councillor of the town of Boulevarde, St. Pael, Que., through his attorneys, Rivet, Hanfield & Hanfield, is applying to the supreme court for an injunction to prevent the mayor and secretary-treasurer of the municipality for signing a contract for $89,141 for the establishment of sewers in the municipality. The petitioner urges that such a contract should not be signed, because there was a lower tender than that of J. A. Belanger, to whom the contract is awarded, sent in by the Compagnie Canadienne des Entreprises Genereles, and decides that the council should not have awarded the contract during the pendence of the case of Aubertin vs. the town of Boulevarde St. Paul attacking the legality of the bylaw upon which the contract is based.

BUILDING NOTES.

The Y.W.C.A., Toronto, will erect an addition, to cost $12,000.

In Montreal in September permits for new buildings amounted to $449,766.

The new building for the Imperial Bank at Edmonton will cost $90,000.

Building operations in the City of Hull, Que., for 1907, will total $275,000.

Montreal's new post office will cost in the neighborhood of $500,000. It will be completed in May, 1909.

W. & D. Dineen, Toronto, will erect a factory at the rear of their premises, for the cutting and making of furs.

The new building for the Imperial Bank at Edmonton will cost $90,000. It will be completed in the near future.

Building permits to the value of $385,700 were issued in Stratford during September. The new G.T.R. shops alone, will cost $360,000.

Building permits to the value of $385,700 were issued in Stratford, Ont., during September. The new G.T.R. shops, alone, will cost $360,000.

Although more building permits were taken out in Montreal last month than in September, 1906, the value is less. This is said to be due to the scarcity of money. The permits for new buildings amounted to $449,766, and for alterations, $44,979. In 1906, the values were $725,505 and $66,745.

PLUMBING AND HEATING MARKETS

TORONTO PLUMBING MARKETS.

Toronto, Oct. 22.—During the past fortnight there has been a marked increase in the volume of orders coming in to local jobbers for fall and winter plumbing supplies. As far as sales are concerned, no particular class of goods appears to be leading, but the general demand for plumbing supplies throughout the Toronto markets is decidedly stronger than it was two weeks ago.

Iron Pipe—Jobbers report the scarcity of the smaller sizes to be as marked as ever. Premiums are still freely offered for the scarce sizes by buyers ; one large supply house has been in the market for some time for a quantity of ½-inch galvanized, and offers to pay as high as $4, but the pipe has not been forthcoming. The same firm refuses to quote this size to retailers at all, knowing the impossibility of procuring it. Interrogated concerning the pipe scarcity, a leading producer to-day gave it as his opinion that the worst stage of the scarcity is now over and that from this time forward supplies should steadily improve. While there is no doubt that the makers are not restricted in securing raw material to anything like the extent they were a short time ago, the fact remains that at present they are so far behind in their orders that jobbers cannot reasonably hope for an adequate supply of some sizes before the beginning of the new year. Prices are very firm as follows : ½-in. black pipe, $2.90 ; ½-in. galvanized, $3.75 ; 1-in. black, $5.60 ; 1-in. galvanized, $7.25.

Soil Pipe—A brisk demand exists for soil pipe and the new list adopted last week means a slight advance in the price, although the discounts have not been greatly altered. The manufacturers —after slashing prices for some time— are now beginning to assume a more friendly attitude toward each other and the market shows a pronounced upward tendency as a result. We now quote :— Medium and extra heavy pipe and fittings, up to 6-inch, 70 per cent.; 7 and 8-inch pipe, 40 per cent.; light pipe, 60 per cent.; fittings, 60 per cent.

Lead Pipe—An active demand prevails and in sympathy with the pig lead markets the price has developed considerable firmness, though still quoted at 5 per cent. off list.

Solder—Sales have increased to a considerable extent during the past fortnight. Wiping solder is quoted at from 23c to 25c per pound.

Radiators and Boilers—Business is flourishing in both of these lines and the manufacturers are loaded up with orders. Since the recent advance in radiators there has been no further change in prices which remain firm at figures last quoted. Boiler prices have shown an upward tendency during the past two weeks and are now quoted at from 50 per cent. to 50 and 10 off list.

Brass Work—Business in brass work is splendid for this time of the year and local houses have received many good orders during the week. Compression work is quoted at 60 per cent., and fuller work is held at 65 per cent. off list. Ground work quotations run as follows: Bibbs, 45 ; roundway, 50 ; and flatway work, 50 and 10 per cent.

Cast Iron Fittings—Trade is brisk and price-cutting has largely ceased. The prevailing discount on fittings is 57½ per cent.

Enamelware—A healthy demand is making itself felt for all classes of enamelware. The September 1st list, covering bath, as well as other enamelware, went into effect among local jobbers last week.

MONTREAL PLUMBING MARKETS.

Montreal, Oct. 21.—During the past three or four weeks the local plumbers have been very busy on job work and they expect to be busy for two or three weeks more. A large volume of outside work is being done before the cold weather commences. The jobbers are doing a good amount of business in all lines of plumbers' supplies. They complain, however, of tardy settlement of accounts, but generally they are well satisfied with trade.

Iron Pipe—A large number of orders are being filled by the factories and prices are firm. The market at present is featureless, there being no alteration in quotations and little or no variation in the demand. We continue to quote : One-inch black, $5.60; one-inch galvanized, $7.25.

Lead Pipe—The demand continues steady with firm and unchanged quotations : Lead pipe, 7c; lead waste, 8c; discount 5 per cent.

Cast Iron Fittings—Makers are working at their utmost capacity in production and there is still a shortage. Quotations are unchanged : Discount, 60 per cent.

Soil Pipe and Fittings—A new price list has been issued. It will be remembered that on May 24 of this year the American Manufacturers revised and issued a new list, Canadian makers have been gradually revising their lists to conform with the American lists. The discounts on the products of Canadian manufacturers have been slightly altered. We now quote : Medium and extra heavy pipe and fittings, 2 to 6, 70 per cent. off ; 7 and 8, 40 per cent.; light pipe, 60 per cent.; fittings, 70 per cent.

Enamelware—Makers are busily engaged supplying current demands and stocking-up for the winter. Western shipments are generally delayed. The outlook for the winter trade is bright. Quotations are unchanged.

Brass Goods—A large amount of business is being transacted. The low price of copper has materially affected the quotations. There is, however, no further decline from the last quotations.

Radiators—Are being sold in large quantities. Prices are unsteady and considerable cutting prevails in the local market.

Hot Water Boilers—Especially in Quebec Province, a large number of boilers are being sold, with very bright prospects for the coming winter. Stocks are pretty well depleted.

Metals—Considerable hesitancy and uncertainty exists in local circles. Copper is easier ; lead is unchanged at $5.75 for bar ; pig iron is steady at $21.50 for Middlesboro No. 1 ; $20.50 for No. 2, and $25.50 for Summerlee. Scrap iron is quiet at $17; heavy copper and wire, 12¼c; light copper, 11¼c; heavy red brass, 11c; heavy yellow brass, 8c; light brass, 6c; heavy lead, 3¾c; scrap zinc, 3c; No. 1 wrought iron, $14.50 ; No. 2, $6.

CONDENSED OR "WANT" ADVERTISEMENTS.

RATES.

Two cents per word first insertion ; one cent per word subsequent insertions.

Five cents additional each insertion where box number is desired.

Contractions count as one word, but five figures (as $1,000) are allowed as one word.

Cash remittances to cover cost **must** accompany all advertisements. **In no case** can this rule be overlooked. Advertisements received without remittance cannot be acknowledged.

RULES FOR COPY.

In addressing replies care of PLUMBER AND STEAMFITTER don't fail to give box number.

Replies addressed to PLUMBER AND STEAMFITTER boxes are re-mailed to advertisers every Monday, Wednesday and Friday.

Requests for classification will be followed where they do not conflict with established classified rules.

Orders should always clearly specify the number of times the advertisement is to run.

All "Want" advertisements are payable in advance.

FOR SALE.

PLUMBER'S Cabinet for sale, cost $75, stands nine feet high and is 6 feet wide, contains 68 drawers, ranging in size from 3 in. x 3 in. to 6 in. x 18 in. Am installing larger cabinet, otherwise would not think of selling. Box 649, Plumber and Steamfitter, Toronto.

BUSINESS CHANCES.

OFFICE space wanted by manufacturer in Toronto : state location and terms. Box 645, Plumber and Steamfitter, Toronto.

SITUATION VACANT.

WANTED—A salesman familiar with plumbing supplies and gas ranges, to represent a Canadian manufacturer direct to the wholesale and retail trade; must have acquaintance with the trade ; best of references will be expected ; give full information concerning experience, acquaintance with the trade, salary expected ; good position for the right person. Only those who can fill the above qualification need apply, Box 639, Plumber and Steamfitter, Toronto.

THE WANT AD.

The want ad. has grown from a little used force in business life, into one of the great necessities of the present day.

Business men nowadays turn to the "want ad." as a matter of course for a hundred small services.

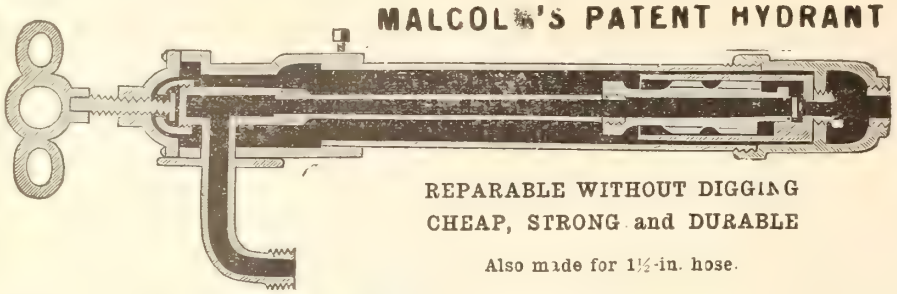
The want ad. gets work for workers and workers for work.

It gets clerks for employers and finds employers for clerks. It brings together buyer and seller, and enables them to do business, though they may be thousands of miles apart.

The "want ad." is the great force in the small affairs and incidents of daily life.

FLEW THROUGH FLUE.

A fly and a flea in a flue
Were imprisoned, so what could they do?
Said the fly : "Let us flee."
Said the flea : "Let us fly."
So they flew through a flaw in the flue.



MALCOLM'S PATENT HYDRANT

REPARABLE WITHOUT DIGGING
CHEAP, STRONG and DURABLE

Also made for 1½-in. hose.

MALCOLM & CO. TELEPHONE MAIN 5101 64 Lombard St., Toronto

Any Boy Who Has 1 Cent Can Turn it Into

$ 10 $

One cent invested in a post card to us will bring you information about how we can start you in business, so that you can earn money for yourself. You can make plenty of pocket money all the time—money you will enjoy the more because you made it in business for yourself. Hundreds of boys are doing this. *SO CAN YOU.*

NO MONEY REQUIRED——————WE FURNISH CAPITAL

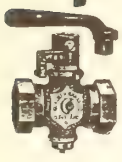
We also give prizes There is a prize for every boy whether he lives in a large city or a little village. Very fine prizes have gone to fellows in small places. Don't delay a minute. Write us to-day. A post card will do.

THE MACLEAN PUBLISHING CO. Limited
10 Front Street East, TORONTO

NEW NIAGARA FACTORY FALLS

We've hitched our Factory to the Falls to enable us to make ***better Bath-Room Fixtures*** than can be obtained anywhere else.

NEW ADDRESS:
The Carriage Mountings Co., Ltd., Niagara Falls, Canada



INSTALL THE

ONLY BRASS GOODS

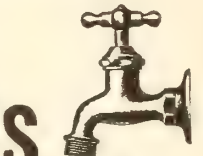
MADE

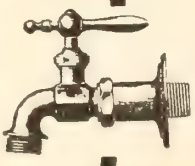
GUARANTEED 5 YEARS

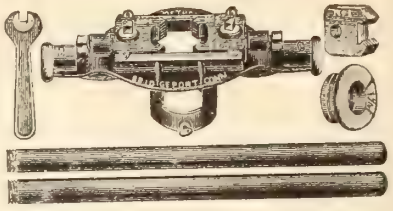
They make good customers

Glauber Brass Mfg. Co.

CLEVELAND, OHIO, U.S.A.







The Armstrong Manufacturing Co.

317 Knowlton St., - Bridgeport, Conn.

Manufacturers of the Genuine Armstrong Stock and Die, Malleable Iron Hinged Vises, Pipe Cutters, Pipe Wrenches, Bard Adjustable Bushings, Ratchet Attachment for Stock, Pipe Threading and Cutting-off Machine--Hand and Power. Our goods are sold by all Jobbers.

CATALOGUE MAILED ON REQUEST

If you can use High-grade Low Down Compression Basin Cocks with China Index Handles, ask for the Acme Brass Works Nos. 4, 5, 6 and 7 Basin Cocks, which are just what you want. They are the acme of perfection in style, workmanship and durability.

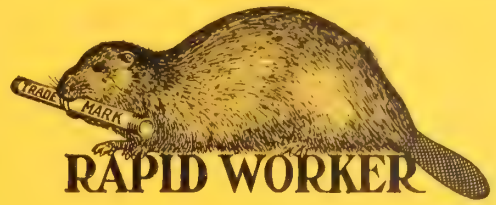
Write us to-day.
Do not delay for to-morrow.

Acme Brass Works
CLEVELAND, O.

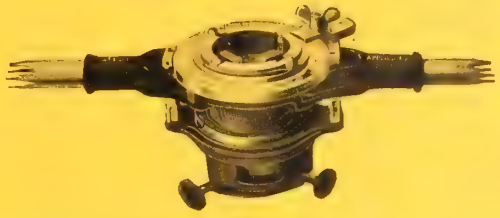
Let Our Beaver Do Your Work.

You Don't Have to Change Dies.

Cuts 1, 1¼, 1½ and 2" perfect threads, all with one set of chasers



RAPID WORKER



The Hand Stock that Starts Easy and Finishes Easier.

"The New Way."

You Will Find it a Sure-enough Beaver.

Write for our special 10-day trial offer

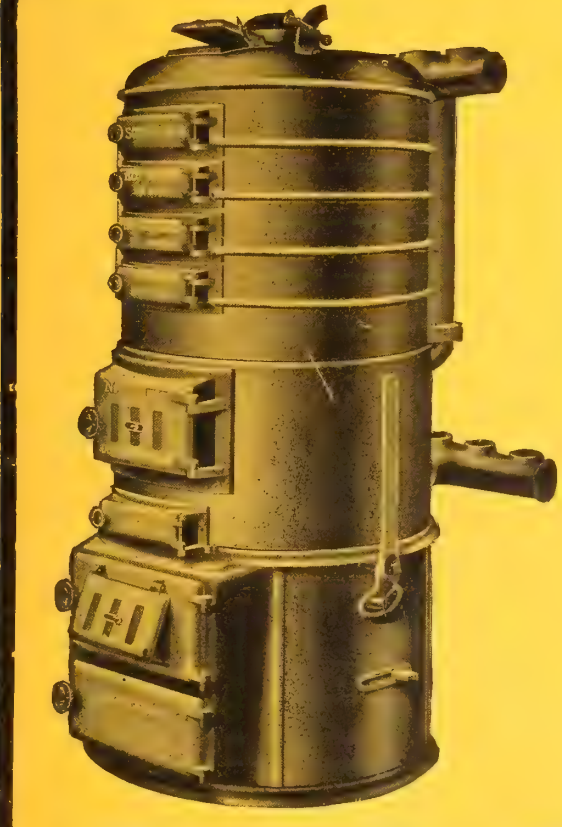
You cannot afford to take the time to thread pipe by hand in any other way

Other sizes of Beavers will soon be born—¼ to ¾—2½ to 4—4½ to 8—8 to 12

Manufactured by

Borden-Canadian Company

166 Adelaide Street West, Toronto



"Sovereign" Boilers

have several points which make them more saleable than ordinary boilers. From the base-ring of the boiler to the "Sovereign" radiator in the topmost attic room, the

"Sovereign" Heating System

has yet to be equalled for efficiency and economy. Take the matter of fuel combustion. The fire-pot and combustion chamber are so constructed that every particle of combustible element, even in the very smoke, is consumed. This point of fuel economy, is alone sufficient to sell the "Sovereign" Boiler.

There are other points explained in "Simplified Heating," which is free for the asking. Send for a copy

TAYLOR-FORBES CO., Limited

Head Office and Works:—GUELPH, ONT.

TORONTO—1088 King St. W. MONTREAL—122 Craig St. W.

WINNIPEG—The Vulcan Iron Works, Limited

ST. JOHN, N.B.—H. G. Rogers, 53½ Dock St. QUEBEC, QUE.—The Mechanics Supply Company. VANCOUVER, B.C.—Boyd, Burns & Company.

Architects, Builders and Plumbers

freely endorse

Standard Ideal Porcelain Enameled Ware

Dealers handling Standard Ideal Ware are assured of larger sales, better satisfaction and greater profits. Manufactured in Canada, this ware is the equal of any foreign product of a like nature.

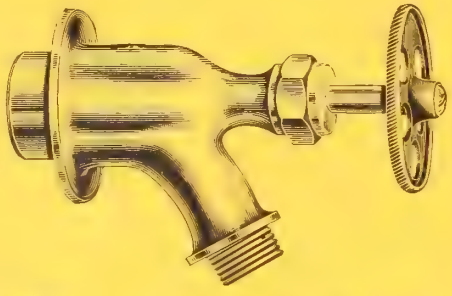
We manufacture Bath Tubs, Sitz Baths, Shower Baths, Sinks, Lavatories, Urinal Ranges, Slop Hoppers, Laundry Tubs, Closet Ranges, Steamship Supplies, Railway Car Supplies, Hospital Appliances, etc.

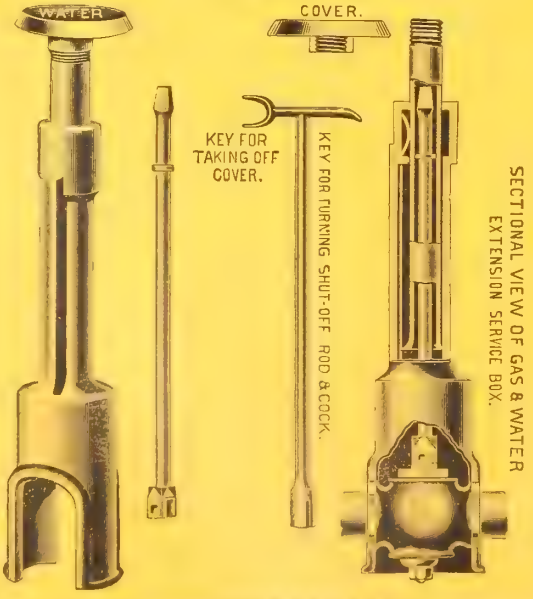
THE STANDARD Ideal COMPANY LTD.

Head Offices and Factories, - PORT HOPE, Ont.

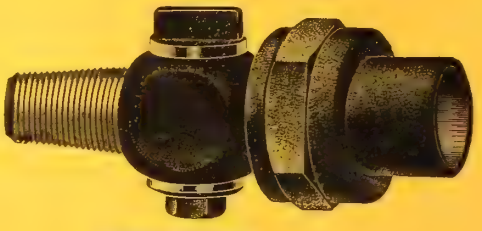
Sales Offices and Sample Rooms: TORONTO, 50 Colborne St. MONTREAL, 128 West Craig St. WINNIPEG, 156 Lombard St.

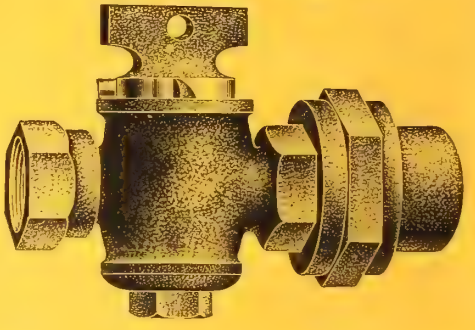
(517)





Fittings That Don't Disappoint





For

Plumbing, Water, Gas and Steam

Hays Manufacturing Co.

Complete Works: - - - ERIE, PA., U.S.A

PLUMBER & STEAMFITTER OF CANADA

THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

MONTREAL, 232 McGill St. TORONTO, 10 Front St. E. WINNIPEG, 511 Union Bank Bldg. LONDON, ENG., 88 Fleet St. E.C.

Vol. I. No. 15. (New Series). Publication Office : 10 Front St. East, TORONTO, NOV. 6, 1907. Old Series, Vol. XIX. No. 25

Finest Brass Plant in America

Our increased business, with the demand for a better quality of Brass Goods, has made necessary the establishment of the above plant, which the cut shows in an incomplete state, but which will be ready for operation in about another month.

SOMERVILLE LIMITED

59 Richmond St. East, TORONTO

When You Buy

Robertson's Acme

Low-Down or High-Up Closet Combinations

You Get the Best on the Market.

We also carry a full line of Plumbers' and Steamfitters' Supplies.
Send us your enquiries.

The James Robertson Company, Limited
Toronto and Montreal

METROPOLITAN CLOSET OUTFIT

BEST COMBINATION
IN THE WORLD.

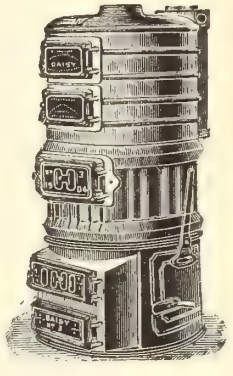
SOMERVILLE LIMITED

59 RICHMOND STREET EAST - TORONTO

The DAISY Boilers

are built according to the requirements of the most correct and scientific principles. The circulation is positive and rapid. There is more grate and fire surface than seems necessary to carry the listed ratings.

But it is just such business practice that has made the DAISY the most popular boiler in Canada, and has created a greater demand than all other makes combined.

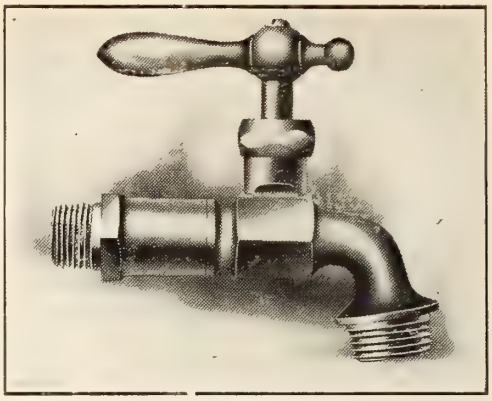


CLUFF BROTHERS

Lombard Street, TORONTO

Selling Agents for WARDEN KING & SON, Limited

HOT WATER FITTERS



All over ***Canada*** are rapidly getting the habit of using the

"Monarch" Quick Opening Valves

Easy to connect, perfectly reliable, fully tested. Send in your specifications, get our quotations, orders sure to follow.

The Monarch Brass Mfg. Co., Limited

Factory, Port Colborne

Office and Warehouse - - - - 278 Dundas St., Toronto

(PATENTED)

Mueller Interchangeable Right or Left Fuller Basin Cock

Put within the plumber's power the option of making the cock right or left as the job demands.

Remove a nut and reverse the spout —that's all there is to it.

Its practical and convenient, and solves the problem of left over odd cocks.

Unconditionally guaranteed. Prices on application.

TRADE MARK MUELLER REGISTERED

Works and General Offices
DECATUR, ILL.
West Cerro Gordo Street

H. MUELLER MFG. CO.

Eastern Division
NEW YORK CITY
254 Canal St., cor. Lafayette

What Class of Men do You want to Reach?

When you insert a condensed advertisement we presume you want the largest number of responses possible from the best class of people. This cannot result through using only local mediums.

Did you ever stop to think how many Plumbers and Steamfitters read any one of our large dailies? If you have a business for sale or wish to engage a clerk you will not be content to have your advertisement seen by men in any one locality. THE PLUMBER AND STEAMFITTER is not a Montreal, Toronto or Winnipeg paper. It is an ALL CANADIAN NEWSPAPER, and reaches practically all the men engaged in the Plumbing and Steamfitting trades from the Atlantic to the Pacific. Your message will be carried quickly. THE PLUMBER AND STEAMFITTER is mailed the second Wednesday of each month. On Thursday all subscribers in Ontario should receive their copy and by the end of the week your message will have been read by practically every Plumber and Steamfitter from Halifax to Vancouver.

Rates for "condensed ads." : 2c. per word first insertion
1c. " " subsequent insertions.

PLUMBER AND STEAMFITTER

MONTREAL TORONTO WINNIPEG

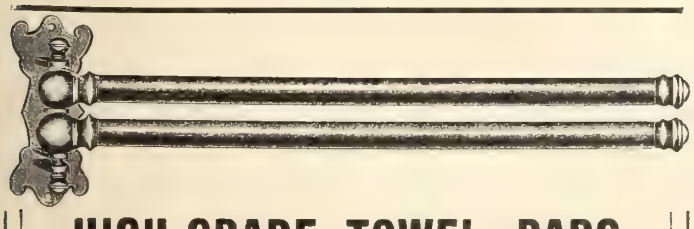
NIAGARA CHAIN *for* PIPE HANGING

Most convenient and neatest as well as the most economical hanger on the market.

Pipe may be hung any distance from ceiling with this hanger. Permits of easy and exact adjustment.

Write for samples and prices.

ONEIDA COMMUNITY, Ltd.
NIAGARA FALLS, ONTARIO

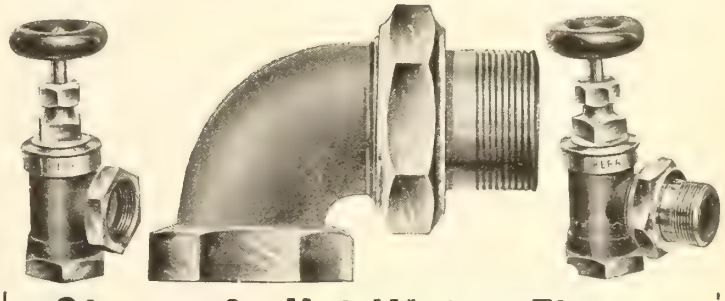


HIGH-GRADE TOWEL BARS

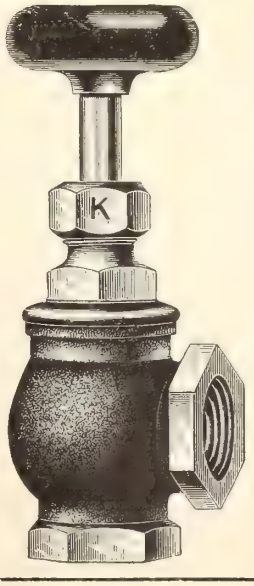
Soap Dishes, Sponge Baskets, Tumbler Holders, Paper Fixtures, Bath Sprays, Etc., Etc.

Manufactured by

THE CARRIAGE MOUNTINGS CO. LTD.
Niagara Falls, Ont.



Steam & Hot Water Fitters



who handle KERR VALVES are the leading men in their line.

You should use Kerr valves for they improve your reputation for high-class work.

Made by a long established and responsible firm.

WRITE FOR CATALOG

THE KERR ENGINE CO.
Valve Manufacturers
LIMITED
WALKERVILLE, ONT.

Ventilating the Brass Foundry

A Plea for Healthful Conditions in the Grinding, Polishing, Tumbling and Sand Blast Departments made by Walter B. Snow in a Paper read before the American Foundrymen's Association at Philadelphia.

In much of the early work done for the welfare of the employe there was a strange confusion of motives. Even though the project was primarily humanitarian in its spirit, the advertising department got in its work in proclaiming this spirit to all the world. But out of this confusion has now grown a definite recognition of the purely economic advantages of surrounding the workman with healthful conditions. While some other industries are more directly harmful to the health than is the brass industry, there is, nevertheless, ample opportunity within its field to greatly improve the conditions. Although the heat and fumes are primarily uncomfortable and only secondarily injurious, the greatest harm is done by the dust which is inhaled. This dust is usually of mineral or metallic origin resulting from the grinding, polishing, tumbling, and sand blasting processes, and also from the shaking out of the castings.

Injurious Industries.

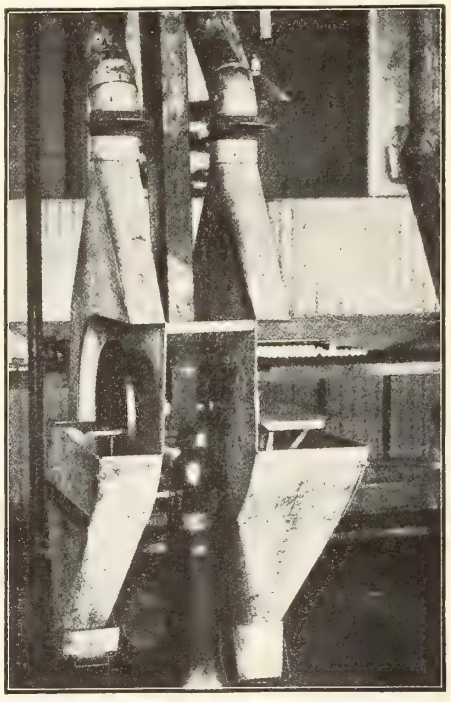
It is commonly recognized that life is shortened by working in a dust-laden atmosphere, but the extent to which some industries are injurious is startling. In the cutlery and tool industry, which is declared to be one of the most dangerous of trades in this class, the average age of the operatives at death is exceedingly low and in establishments conducted with out proper hygienic precautions sound men are rare after a few years' work. The prevailing cause of death is consumption, which usually overtakes a susceptible worker so early that his period of usefulness does not extend much beyond five or six years, except where the health is properly safeguarded.

The testimony of physicians is, that of those employed in this industry nearly all who reach the age of 40 die of consumption, excepting those who succumb to some acute disease. As proof of this statement, it is instructive to note that in Northampton, Mass., an important seat of the cutlery industry, the death rate from tuberculosis for the entire male adult population was 2.9 per thousand, while that for the cutlers of that town was four times as great; namely, 11.8 per thousand. The trouble lies not so much in any directly poisonous results from inhaling the dust as in its power to bring about constant irritation, which produces such a condition of the mucous surfaces that they more readily admit of invasion by disease germs. Fortunately brass is less irritating than steel, and consequently the results in the brass industry are not as disastrous as they are among the cutlers. But the dust of corundum and emery is peculiarly irritating, and the brass workers' surroundings are therefore susceptible of marked improvement.

Laws to Safeguard Health.

The unhygienic conditions existing in the various industries have received the attention of State Boards of Health, whose official investigations are bringing about the passage and enforcement of more stringent laws looking to the safeguarding of the health of the employes in all industrial establishments.

In a word, advance has been made from a matter of individual interest to one of almost national importance. The statute books of the leading States already contain laws, usually somewhat vague in their expression, which require cleanliness, light, warmth, ventilation, and the introduction of specific devices for removing dust, fumes, and the like. While the first impulse of the manufacturer may be to resent the enactment of further laws, yet his compliance with them is not without eventual advantage. Not only will a better class of men prefer to work for him if improved conditions are provided, but there will be far less interference with work because of sickness, more energy in the work which is done, and less loss by death of the potential value possessed by the man who has become thoroughly skilled in a given line of work. Continued sickness and death naturally mean constant replacement of individuals, with the loss of knowledge and skill gained by those who have gone. As a result there is far less stability of employment in an unhealthy industry.



Grinding Discs Equipped with Special Hoods Designed to give Freedom to Workmen.

Ventilating Appliances.

Experience has shown, and the reports of investigations confirm the fact, that mechanical means are absolutely necessary to maintain a rapid air change or to insure proper removal of dust. In fact, the fan blower figures everywhere as the only device adapted to secure these results. It is manifest that the action must be positive, and of sufficient intensity to create ample movement of air. Where there is but little dust or the requirements of ventilation are slight, a fan applied for mere renewal of air throughout the entire extent of a room will meet the requirements. When warranted by the size of the plant the fan may form part of a blower heating system, by means of which warm air from a centralized heater is delivered under pressure through pipes to all parts of the building. In overheated rooms and particularly for summer ventilation the disc or propeller type of fan meets the requirements if placed in wall or ceiling.

Wherever dust or fumes are formed locally, as in connection with grinding and polishing wheels, tumbling barrels, or furnaces, the exhaust should be direct from hoods which enclose the objectionable source as completely as possible. In a word, prevention is better than cure. The objection which is often shown by workmen to hoods and similar contrivances—even to the extent of actual destruction—is largely due to their improper construction. In fact, the cause for condemnation or criticism of many exhausting systems lies in the method of application of the fan, and not in the fan itself. The success of the fan not only depends upon its speed and its proper proportioning to the work, but also upon the system of piping and hoods which would give the greatest efficiency. It seems so simple to employ a local tinsmith to rig up an exhausting system that it is not strange that unsatisfactory conditions result.

It is far better policy to secure the best advice, which will always be freely given by blower manufacturers, and then have the thing done right. It must not be overlooked that the installation of an economical exhausting arrangement requires definite engineering ability, and should only be undertaken by one who makes a specialty of this particular class of work.

Cost of Installation.

Because of the lower first cost the user is always strongly tempted to buy the smallest apparatus that can be made to do the work. But first cost is only

one of the factors in the total cost. Large slow running fans with ample pipe areas are conducive to small power expenditures. It is easy to save enough in power in six months to pay the additional cost of a more efficient outfit or system. Thereafter its economy is all clear gain.

Even though the fan be of ample size when first installed, it may, as a result of speeding up to meet added requirements, frequently demand from 50 to 100 per cent. more power than would be necessary to do the work with a proper outfit. It is none too generally understood that the power required to drive a fan increases as the cube of the speed. In other words, that doubling the speed calls for an eight-fold increase in power, while 27 times the power is required at three times the speed; an increase of only 25 per cent. in speed calls for nearly double the power, and yet such an increase is common enough. How long would it take to pay for a new outfit from the money thus squandered in excessive power?

Design of Hoods.

The designs of hoods for grinding, polishing, or buffing wheels are many and varied. Each must be arranged to suit the particular class of work for which the wheel is used. In some cases it is even necessary to have several different types in the same room. This is true where the pieces of such shape and size that it is impossible to get very close to the wheel, the result being that at one time the operator uses the wheel at a point near the top, and again at a point directly underneath. Under these conditions especial care must be taken to provide the most effective type of hood and maintain the maximum blast. In heavy work of this type the air suction pipe should be five inches in diameter for wheels up to and including 16 inches in diameter by three-inch face. In ordinary grinding and buffing rooms the suction pipes should be four inches in diameter for wheels 2½ inches or less in width, and from 10 to 18 inches in diameter. Wheels ranging from 19 inches to 28 inches should have 5-inch or 6-inch pipes according to class of work for which they are used.

All hoods should be so designed that the velocity through the openings should not be less than 5,000 feet per minute, which is usually sufficient to create the draft necessary to carry away the particles. The best general type of hood is of patented form, provided with a receptacle below to trap out all heavy particles, as well as the threads from the buffing wheels, while allowing the finer dust to pass through the pipe. The result is that the metallic particles are left in clean condition ready for resmelting, and the wear on the pipes and the fan is greatly reduced. This arrangement also prevents the annoyance caused by the dust from the rag wheel adhering to the fan wheel and throwing it out of balance. The trapping-out feature furthermore permits of the ready recovery from the bottom of the hood of any small piece of work or other material, which with other types of hoods might get into the main trunk line or up into the fan.

All properly designed systems should have clean-cut caps so as to provide free access to the interior of the piping for the removal of anything that might possibly tend to clog it. The main suction pipe should be proportionately increased in size as each connection is made to it.

Fan Installation.

To secure the most economical results a fan should be chosen which has an area of inlet about twice the combined area of the inlet pipes. This proportion will give the maximum velocity through the branch pipes and hoods. The fan should then be operated at about 1½-ounce speed, under which condition it would consume about ½-horse-power for each 4-inch opening.

The most work is done, and consequently the most power is required by a fan when it is discharging with free inlet and outlet. The more extended the system of piping, the smaller the area of inlet or outlet; and the greater the friction, the less will be the volume delivered by the fan; and consequently the less will be the power required to drive it. It is therefore manifest that the fact that the fan is consuming but little power is not always evidence of its successful operation, for it may be doing little effective work.

The dust which is collected by the fan should be discharged into a centrifugal dust collector. Here the dust is separated from the air by centrifugal force; the air escapes from the top practically free from dust, while the dust itself drops out of the bottom through a pipe. It should be periodically removed. The dust from wheels grinding iron and steel should not be mixed with that from rag wheels, for in some cases fire will result. Separate fans and systems should be used.

Exhausting From Tumbling Barrels.

The same general principles hold in connection with systems exhausting from tumbling barrels. If a maximum effect of the fan is desired on tumbling barrels equipped with hollow trunnions, the area of fan inlet should be about double that of the sum of the openings in the trunnions. The sizes of pipes and the speeds of fans to be applied in connection with housed rattlers must depend largely upon the conditions, but a 6-inch pipe connection will usually serve for each tumbling barrel, if the same is tightly enclosed. A fan running at about one ounce speed will give sufficient draft.

No general rules can be given for the application of the fan system to sand-blast rooms or apparatus. The arrangement must depend entirely upon the local conditions, but the provisions must be generous if successful results are to be obtained.

With installations such as are here described it is possible to maintain a relatively healthy atmosphere, which is bound to insure better work.

UTILITY OF FAN BLOWERS.

With the possible exception of the steam pump, writes Walter B. Snow, it is doubtful if any other mechanical device has so varied a field of direct application as the fan blower; these two machines really being in the same class, the one handling liquids at pressures measured in pounds, while the other creates movement of air and gases under pressure, differences measured in ounces.

Fan blower applications may be broadly divided into two classes. First, those in which the object is to actually transport the air or gas, and second, those in which the air serves as a medium for the transportation of other materials. Ventilation and the supply of air for combustion are properly included under the first classification. The conveyance of light material and the transmission of heat or moisture in the air come within the second classification.

Ventilation whether secured by natural or artificial means results only from the creation of a pressure difference between two points such as to cause a flow of the liquid from the higher and the lower pressure area. In the case of natural ventilating systems maximum efficiency is secured only through the employment of flues and ducts of large area, through which the air flows at low velocity. At best, the mechanical efficiency of the heater flue is very low. With a fan, however, much greater pressure difference can easily be created and smaller pipes with higher air velocities employed. With the fan, the heat expenditure necessary to produce a given air movement is surprisingly less than with natural draft in a flue or chimney.

According to the degree of activity of the occupant the velocity of the air admitted to the room may be high or low, but it is easily regulated where a fan is employed. In the sparsely-occupied building the per capita space is large, the air volume therefor required is relatively small, and the rate of flow may be high. In the crowded hall of audience the minimum of floor space is provided for each occupant and the maximum of air supply is required. Here the utmost refinement is necessary in the tempering and distribution of the air.

In the ordinary building, ventilation is very properly a process of substitution of fresh air for foul air, but the fan does not absolutely control the conditions, for the walls are usually porous and there are leaks around the windows and doors. In the mine, however, with its practically air-tight chambers and its vertical shaft, there is no appreciable inward or outward leakage. All air which passes through the mine likewise passes through the fan, very positive control being had over its distribution.

The limits of the realm of the fan blower cannot be established, its boundaries are constantly increasing, new processes and industries depend upon it for successful operation, old applications are improved by its introduction, it is a boon to all mankind.

Make your customer the best possible price you can at first, and maintain it. If he wants to "jew" the price down tell him kindly you have made the best price possible, and stick to it—sale or no sale.

PLUMBER AND STEAMFITTER OF CANADA

The MacLean Publishing Co.
Limited

JOHN BAYNE MacLEAN - - - President
W. L. EDMONDS - - - - Vice-President
H. T. HUNTER - - - BusinessManage
WESTON WRIGLEY - - - Managing Editor

Publishers of Trade Newspapers which circulate in the Provinces of British Columbia Alberta, Saskatchewan, Manitoba Ontario Quebec Nova Scotia, New Brunswick, P. E. Island and Newfoundland.

OFFICES:

MONTREAL - - - - - - 232 McGill Street
Telephone Main 1525
TORONTO - - - - - - 10 Front Street East
Telephones Main 2701 and 2702
WINNIPEG - - - - 511 Union Bank Building
Telephone 3726
LONDON, ENG. - - - - - 88 Fleet Street, E.C.
J. Meredith McKim
Telephone, Central 12960

BRANCHES:

CHICAGO, ILL. - - - - - 1001 Teutonic Bldg
J. Roland Kay
PARIS, FRANCE - Agence Havas, 8 Place de la Bourse
MANCHESTER, ENG. - - - - 92 Market Street
ZURICH, SWITRERLAND - - - Louis Wolf
Orell Fussli & Co.

Subscription, Canada and United States, $1 00
Published Twice Every Month

OFFICERS OF NATIONAL MASTER PLUMBERS' ASSOCIATION.

Past President—F. G. Johnson, Ottawa.
President—John Watson, Montreal.
Vice-President—Joseph Laurier, Montreal.
Secretary—H. A. Knox, Ottawa.
Treasurer—Harry Mahoney, Guelph.

Provincial Vice-Presidents—
Ontario—Charles Taylor, Brantford.
Quebec—J. E. Walsh, Montreal.
Nova Scotia—F. Dexter, Truro.
New Brunswick—H. Dryden, Sussex.
Manitoba—A. J. Hammond, Winnipeg.
Alberta and Saskatchewan — E. J. Young, Calgary.
British Columbia—Bert Weeks, Vancouver.

Chairmen of Committees—
Legislation—H. J. Chandler, Ottawa.
Apprenticeship—J. A. Thibeault, Montreal.
Sanitary—L. Legrow, Toronto.
Essay—G. A. Wootten, Halifax.
Organization—H. McCauley, Montreal.

PHOTOGRAPHS IN ADVERTISING.

Following up the talk on "Personal Advertising" in our issue of Plumber and Steamfitter, it has been suggested that Canadian plumbers and steamfitters do not use the camera often enough in their advertising work.

Across the line many master plumbers make a practice of having photographs made of their neat appearing bathroom and public building jobs, etc., keeping copies of the photos in the shop for customers to inspect. Occasionally a Canadian plumber is found who is equally enterprising, but as a rule this branch of advertising is neglected and master plumbers have nothing but catalogues or blue prints to show to customers, who have a vague idea of what they want and can be landed for good contracts if a clear idea can be given them of what they are to get for the money spent.

It seems clear that the plumber who believes in quality and takes a pride in good work will soon gain a reputation which will allow him to secure contracts at figures which will allow a satisfactory margin of profit. Much will be lost, however, if a plumber neglects to have photos of work done by himself in residences or buildings, the mere mention of which will give the prospective customer a favorable impression. It is well to have a pride in one's work, but it is practical to turn this to good advantage from a business standpoint.

Show the prospective customer that you have had sufficient pride in your work to get it photographed and it will bring you business. And show the customer whose job you have completed that you think well enough of his job to have a photo taken and you will leave him pleased.

Back this up by taking him over the job and showing him the good features of the work done, how it could have been scamped, explaining why it is necessary to do plumbing work well to prevent disease. Do this and you will have the customer boosting for you and constantly turning business to your shop.

The Plumber and Steamfitter would like to see more photographs taken of plumbing jobs and offers to reproduce in its columns, without cost, reproductions of photos of modern jobs (or window displays) sent in. As an extra inducement, the editor will give the costly half-tone engraving to the plumber who supplies the photo. The engraving can then be used by him in many ways, on business cards, letter heads, in advertisements, in the reading columns of the local newspaper, or on a private post card sent to a list of prospective customers.

How many Canadian plumbers think enough of our suggestions regarding photograph advertising to accept the offer made?

KILLED BY FURNACE REGISTER.

The death of Miss Grace Dillon, of Champaign, Ill., has baffled the electrical experts, who can find no logical reason for it. Miss Dillon had hold of a long drop cord, grasping the electric light bulb between thumb and first finger. As she walked about her room she stepped upon a galvanized iron radiator which connected by iron pipes to the furnace, and was almost instantly electrocuted.

Her fingers were burned to the bone, but where the current left her foot, passing through a tack in her shoe, it made only a slight black mark. The point of the tack had worn through the skin of her great toe, thus lessening, to a large extent, the resistance of her body.

Electrical experts who examined the house wiring, declare that there was absolutely no evidence to indicate the presence of any high potential current other than the ordinary 110-volt circuit and are completely at a loss to understand how the death occurred. This accident is due to the fact that electric bulb sockets do not completely cover the lamp's metallic end, a condition which all electricians complain about. The coroner's jury exonerated the lighting company. Its electrical engineer, G. W. Caldwell, says: "I believe the underwriters should require that all sockets be long enough to cover the bases of all lamps. They now require that the bases of the lamps be short, but even with this I have not seen one that was so thoroughly covered that you could not touch the live parts."

OHIO PLUMBERS HAVING TROUBLE.

Ohio master plumbers and supply men have been having a similar experience to that of their Ontario brethren a couple of years ago. Not long ago nearly one hundred Toledo master plumbers were indicted for conspiracy and the city was threatened with having their bastile filled with men who would be able to study its sanitary defects. The case has been held over, however, and it is doubtful if results will be any more serious than experienced in Toronto two years ago.

Acting under the Valentine law, the attorney general of the State of Ohio also recently brought suit at Columbus against twenty Ohio firms, manufacturers and wholesale dealers in plumbing supplies, members of the Central Supply Association, alleging that they belong to a "trust," are operating under agreements which violate the provisions of the Valentine law, and seeking the dissolution of the association so far as the Ohio members are concerned. It is also stated in the Cleveland daily papers that a copy of the evidence secured in the case has been furnished the attorney general of the United States. The Valentine law has been on the statute book of Ohio for some years, but its provisions seem very suddenly to have been brought into action in this case.

The Central Supply Association is an old organization, and its aims have ever been to improve the conditions of the trade. It has been engaged in efforts to remove abuses in business methods. It has acted under advice of eminent counsel, lest its acts might be unwittingly illegal. Recognizing the changed public sentiment toward trade associations, it has felt that so great and widespread were the interests of its members, no possible chance should be taken that its operations should be considered illegal,

and its counsel has very recently been asked to study the situation most carefully, and if, in their opinion, the association was doing anything illegal, to advise it so that changes could be made, for it has ever been desirous of benefiting its members only in ways in harmony with law.

The attorney general of Ohio believes that the adherence of the Central Supply Association to the so-called "Detroit trade resolutions" is a violation of the Valentine law. In order to abide strictly by what the attorney general believes to be law, the Central Supply Association voluntarily withdrew from its allegiance to the "Detroit trade resolutions" of the National Committee of the Confederated Supply Associations, and in order to prevent further legal action, the latter body has rescinded the resolutions entirely.

PLUMBING HALF A CENTURY AGO

A two-inch lead S trap, made by James Ryan, of Ryan & Son Plumbing Company, Nashville, Tenn., constructed in 1866, was recently illustrated in "Domestic Engineering." This trap is made of 6-pound lead, and has been in constant use for forty-one years, and is now as good as it was the day it was put under a washstand in the Maxwell House, the largest hotel in Nashville. There was no attempt in those days to vent traps. All washstands in the Maxwell House had lead safes, and 1 and 1½-inch bell traps to carry off leakage from any overflow which might occur. In this trap there is ⅛-inch lead pipe branch above crown of the trap. This was to allow a small quantity of water to drop over the bell trap so as to prevent water in the bell trap from evaporating and allowing sewer gas to pass through it.

It was considered a day's work for a plumber to make four 2-inch lead traps, or three 4-inch traps. Mr. Ryan has often made this amount for a day's work and has heard of plumbers making more, but he has never seen it done.

Mr. Ryan started to learn the plumbing business in 1864, and in the second year of his apprenticeship he worked twelve months steadily at the bench, making traps, lead bends and lead soil pipe. The three succeeding years he worked in buildings, placing fixtures in position and finishing work, most of the time under the instruction of good plumbers. This made up five years of his apprenticeship. During the civil war Nashville was under Federal authority and was selected as the headquarters of the invalid corps of the army of the Cumberland. This necessitated the erection of a great many barracks and hospitals to take care of the sick and wounded soldiers. Henderson Brothers, old plumbers, who were located in Nashville in 1852, had all of this plumbing work to do and were Mr. Ryan's employers. They worked over a hundred plumbers for two years on this work, most of the plumbers having been brought to Nashville from New York. An apprentice in those days certainly earned his money if he worked for Henderson Brothers.

They always bought lead pipe by the carload. It came in hogsheads and was taken out in the morning and laid on the sidewalk all day, and after quitting time, which was 6 o'clock, all the men and boys carried it into the back shop. The boss would not allow it to be rolled. The men had to put their heads through the coils of lead and let the weight rest on both shoulders. The coils weighed about 210 pounds, and one was a pretty good load for a 15-year-old boy. The boss would say as Mr. Ryan went tottering along: "Stand to it; I never saw the day I could not put one on each shoulder and walk off with them." Mr. Henderson had another little stunt which Mr. Ryan did many a time. It was to take a pump weighing 100 pounds, shoulder it and carry it out three miles into the country and put in place. There are two other master plumbers in Nashville in business who worked for the Henderson Brothers fast.'" That is the gait Mr. Ryan out in his statement, as they were obliged to do the same thing.

All the baths used in the hospitals were lined with 6-pound sheet lead, and to line two of these baths was considered one day's work for a man and his helper.

Mr. Ryan worked nine years at the business before going into business for himself in 1873. He has now associated with him his son, James H. Ryan, who is 30 years old, and who has added great vim to the old house. "We were taken for brothers," Mr. Ryan says, "by an old negro woman, and when informed that we were father and son she said, 'Which is the father?' The answer was, 'The one that walks so fast.'" That is the gait Mr. Ryan takes when he goes out to work. It is the gait he learned when he was young, and he has kept it up.

Mr. Ryan says he has laid aside tools and for some years has not used them except during strikes, which, however, are pretty frequent in Nashville. When one of these things comes along he gathers up his kit and finds that he has not forgotten how to use the tools. Although Mr. Ryan is 60 years old, some of the younger plumbers would have to get a "move" on them to do as much work in a day as he can do.

Referring to the business of plumbing, Mr. Ryan says: "I think the master plumber is the hardest worked, poorest paid and least appreciated man in the world; especially is this true of the plumber down south. He is a long distance away from the source of supplies, has no surplus journeymen plumbers to draw on and in dull times, if he lays his men off, he cannot get them when he wants them. In addition to this he has to carry a large stock of goods, and no matter how large a stock a plumber has on hand, the architect is almost certain to call for some fixture he has not got. The plumber may have an exact copy of it made by another party, but it will not answer and the plumbing stock on hand is no good."

WATER-LEAK DETECTIVES.

The city of Cincinnati has adopted a novelty along the line of "leak detectives," and these are now at work throughout the city for the waterworks. Two men have been assigned to the work. They start at one end of a street, one man on each side, and go into every house, examining the plumbing to see whether there are any leaks in the pipes, or any defect in the arrangements or faucets by which water is wasted.

In one hotel in the downtown district they discovered fifty-seven leaks. The leaks are reported to the chief clerk of the waterworks office, who sends notices to the owners or tenants of the premises, notifying them of the leak or other defects of the plumbing. In these notices is the statement:

"Unless same is corrected within forty-eight hours and a plumber's certificate of repair filed at this office, a fine of $5 will be imposed, in addition to turning off the water."

On the back of the notice is the following statement: "The attention of the consumer is called to the following. The wilful waste of water through neglect and carelessness is becoming alarming. You are, therefore, informed that a penalty of $5 will be assessed for every offence in abusing the water privilege, if reported to this office by the inspectors. Under no circumstances will the water be turned on again unless the penalty is paid. Hydrant boxes out of repair must be put in condition within ten days after receipt of this notice. By order of the Board of Public Service."

The chief clerk reports that the leak detectives are doing good work. They are checking a great waste of water and not only benefiting the city, but also property owners who have to pay for water by meter measurements. The chief clerk states that a hole as big around as a pinhead will run 979 gallons of water in twenty-four hours, and as big around as two pinheads will let out 3,600 gallons in twenty-four hours. The cost of water by meter is 7½ cents per hundred cubic feet, which is equal to 750 gallons. Whether the clerk's figures are accurate or not, a great and unnecessary waste undoubtedly exists and can be checked.

Modern Conveniences for Farm Homes

The Sixth of a Series of Articles Intended to Help Canadian Plumbers in Educating Residents in Country Districts to the Necessity of Better Sanitary Arrangements.

By Elmina T. Wilson, C.E.

Sub-surface Irrigation.

It has already been explained that only the upper layer of the earth contains air enough to allow of the bacterial action necessary for sewage purification, and also that nature has her limits and must not be overworked; hence, there must be an intermittent application of the sewage or the process of purification will cease altogether. Although the sanitary results would be accomplished by surface irrigation the character of the soil may allow and the requirements of the family demand the distribution to be beneath the surface.

To secure subsurface disposal 3-inch agricultural draintile are laid with open joints, the bottom of the tile coming within 8 to 12 inches of the surface of the ground. These drains should be laid nearly level or with a very slight fall, say 2 inches in 100 feet. If too steep the lower part of the field can be flooded. The ground should be naturally or artificially so well drained that water will descend through it readily, and porous enough to admit the air. If the subsoil is not porous enough to remove all the water settling through the upper layers it should be underdrained by lines of 4-inch tile spaced from 25 to 40 feet apart. If a suitable outlet can be had these underdrains will do better work if placed 5 feet below the surface, although 4 feet will answer. The outlet should run perfectly free.

The most suitable soil is a sandy loam, while clay and peat are the most unsuitable; although heavy clays can be used, where nothing else is available, by good underdraining and by filling the distributing trenches, after laying the tile, with sand, gravel, or fine cinders. The drainage will improve with time and the soil be able to purify an increased amount of sewage. The length of tile required for distributing the sewage will depend upon the porosity of the soil. For a porous soil 1 foot of tile for each gallon of sewage should dispose of the liquid. If the soil is heavier the length must be increased. For clay there should be at least 3 feet of tile per gallon.

Different Methods Illustrated.

Figures 13, 14, and 15 show different methods of laying out these drains, depending upon the slope of the ground. In Fig. 13, the double-chambered tank is located in the side lawn about 70 feet from the house. A 4-inch vitrified sewer-pipe line, laid with cemented joints, connects the flush tank of 300 gallons capacity with the gate valve (Fig. 16), and two distributing lines of 3-in. draintile, each about 450 feet long, are connected to this gate valve. The character of the surface determined the direction the lines should take to give them the very slight fall required. The joints were first covered with paper to keep the dirt out of the tile until the soil became compact. The trench was partially filled with crushed stone, after the tile had been laid, to increase the porosity of the soil, and then completely filled with earth and the sods replaced. (See Fig. 17.) At the end of each branch a little pocket of stone was placed. This system was designed to have the flush tank empty about every twenty-four hours. The distributing systems were to be used alternately, a week at a time. The gate used to change the flow from one line to the other was operated by hand, being swung from one side of the cast-iron cylinder to the other, which took about one second of time. By this means one drain is given a complete rest of a week to allow the purification of the soil.

Four and one-half cents a foot was paid for this draintile, and the price paid for the gate valve was $10, making the material for this subsurface system cost $46.50.

Fig. 14 shows another subsurface system. The settling chamber and flush tank are located about 40 feet from the house. There is an advantage in placing these as close to the house as practicable. If there is any tendency for sediment to collect in the sewer, the shorter this part of the system is made the less chance there is of trouble from the stopping up of the sewer. If the system is in good working order there should be no odors. The distributing system was located in a very steep hillside, which accounts for the method of laying the drains so as to have the branch lines of about the same length, and the average fall not much more than 2 inches in 100 feet. The 6-inch sewer pipe is laid with cemented joints, with a fall of 4 inches to the 100 feet each way from the dividing chamber. To completely empty the 6-inch sewer-pipe the 3-inch drains should connect with the 6-inch pipe at the bottom, as shown in Fig. 18.

A subsurface system adapted to level ground is shown in Fig. 15. The two underground tanks are used for the sewage and a separate chamber is provided for the siphon. These tanks are placed within 15 feet of the house. As nothing is visible except the iron cover of the tanks and the system is watertight to the place where the disposal

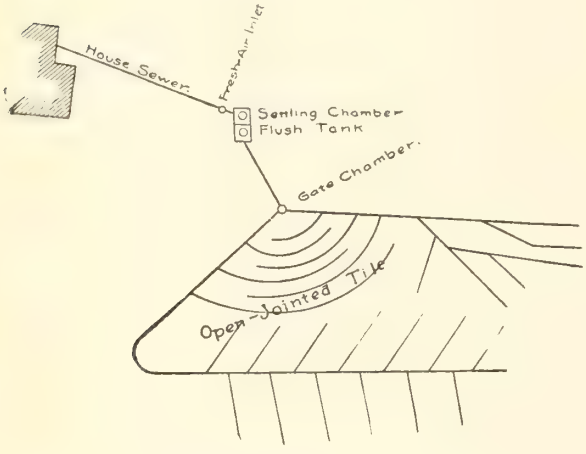


Fig. 13.—Subsurface Irrigation for Sloping Ground.

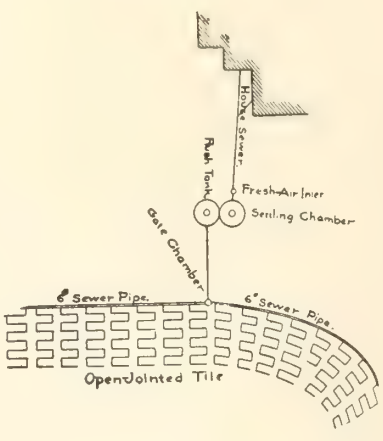


Fig. 14.—Subsurface Irrigation for Steep Hillside.

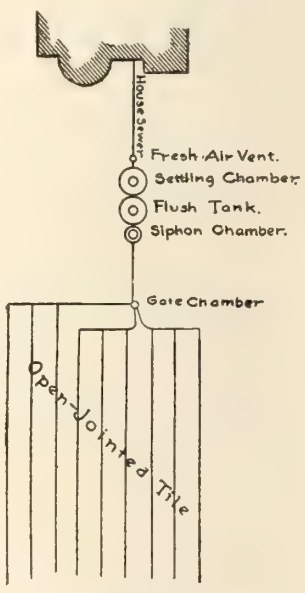


Fig. 15.—Subsurface Irrigation for level Ground.

tiles are laid, there is no sanitary reason that would require an increased distance. The tile lines are divided into three series leading from the gate chamber, so that the ground utilized by two lines is given a complete rest while the other line is in use.

Disposal by Filtration.

Filtration is only a more copious irrigation. The principle of purification is the same. The sewage must still be applied intermittently to allow of the renewal of the oxygen in the filter, and a preparatory treatment to remove the coarser organic matter is necessary to prevent deposits upon the surface of the filter beds. An increased quantity

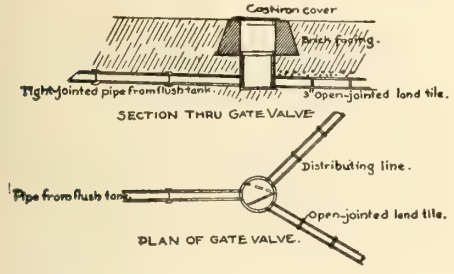


Fig. 16.—Plan of Gate Valve.

of sewage will be purified if the surface of the filter is raked over to the depth of an inch every week. Filters 2½ feet deep require more attention than those of greater depth, but with proper care they serve their purpose well.

A sand filter becomes more effective the longer it is in use, if the surface is kept in good condition. For a family of five, a filter bed with a surface of 200 to 400 square feet should give an effluent that is clear and odorless. Smaller beds can be used, but it means more care in keeping the filters clean and free from clogging, especially in winter. The filtering material should be 3 to 5 feet deep and should be well under-drained. The experiments carried on at Columbus, Ohio, indicate that the best preparatory treatment to be used with fil-

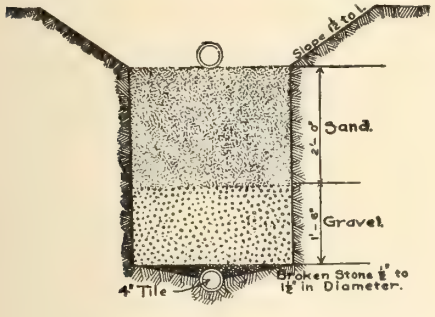


Fig. 19.—Section of Filter Bed.

tration methods was afforded by the septic tank, which would hold an 8-hour flow. From these experiments it would seem that the capacity of the flush tank could be reduced at least one-half if a filter bed was to be used instead of a subsurface irrigation. A section of a filter bed is given in figure 10.

To secure an even distribution over the entire surface of the bed, a 6-inch galvanized roof gutter, pierced every 3 inches with ¼-inch holes, could be laid on the surface extending the entire length. Four-inch drain tile laid with open joints could be used, or a wooden trough having openings every two feet on each side.

Surface Irrigation.

The sewage of a house that has a complete water carriage system is not offensive at first, because the organic matter is so small a percentage of the entire amount. If the liquid wastes can be discharged upon the surface of the ground without undue retention, this method of disposal will be without offence and entirely effective. Where plenty of land is available it is by far the cheapest and simplest method that can be used. A series of outlets should be provided to avoid saturating the ground and as in subsurface irrigation, the application should be intermittent. This is obtained by the use of a flush tank discharging automatically by means of a siphon into a pipe leading to the disposal ground. The number of outlets will depend upon the slope of the ground and the amount of the discharge, but it is well to have three groups of outlets to be used in succession, allowing several discharges upon one field before the gate is changed to bring another group into use. A gently sloping surface of grass land is adapted to this form of disposal without any previous preparation, except the placing of a small platform of stones or brick laid close together at each outlet to prevent the washing away of the earth and aid in spreading the flow over a greater area. The flush tank should be designed to discharge in from twelve to twenty-four hours by means of an automatic siphon.

It must not be expected that once a system is installed there is nothing more to be done. Any method of disposal will require a slight amount of regular attention, but the results will amply compensate for the time and the money expended. Every part of the system, including the siphon, needs attention and occasional cleaning. Of all methods devised by the sanitary engineer for purifying sewage its application to land has secured the best results. While this method cannot be used by many cities on account of the impossibility of securing a sufficient amount of suitable land, it is especially adapted to the needs of the farm.

Disposal of Garbage.

It is the regular taking care of the little things that advances housekeeping to a fine art. The more promptly and regularly all refuse of the household is harmlessly disposed of the better for the healthfulness and comfort of the home. If the ashes are kept free from organic wastes they can be used to advantage on the garden walks or to fill up low places. When taken from the stove or furnace they should never be stored in wooden boxes or barrels or in a fixed ashpit, but in a galvanized can, not too large to be easily emptied, that is fitted with a tight lid. Many serious fires have been started from the inexcusable carelessness of using a wooden receptacle for ashes.

The kitchen refuse from the prepara-

Fig. 18.—Distributing Tile Connection.

tion of the food can be saved for the pigs and chickens. It should be collected in galvanized iron pails furnished with tightly closing covers to prevent exposure to the sun and to avoid flies. These pails should be washed and scalded each time they are emptied, and once a week, especially in summer, they should be rinsed with carbolic acid—a teaspoonful to a pint of water. Whatever cannot be used in this way should be dried and burned.

Things that the junk peddler will take (old tin, iron, leather, rubber, etc.) should be cleaned and stored in sacks in a dry outhouse to await his next visit. No damp or decaying rubbish should be left in dark or out-of-the-way places.

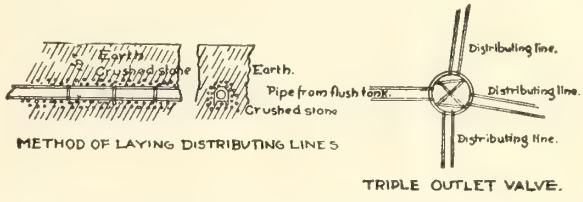


Fig. 17.—Method of Laying Distributing Lines.

IMPROVED PIPE HANGER.

W. D. VanBrunt, Southampton, N.Y., has patented an improved split pipe hanger, adapted for attaching a pipe to a wall or other support. The hanger is of very simple but strong construction, and may be conveniently adjusted to support the pipe. It consists of two parts, one adapted to fit under the pipe and the other over it. Both parts of the hanger are stamped out of sheet metal, bent to U shape in cross-section. The U-shaped walls of the inner member of the hanger are adapted to snugly fit within the walls of the outer member. Both of the members are provided with foot extensions at each side, and on the extensions of the inner member prongs are formed, which are adapted to be driven into the support. In addition to this, the inner member is held in place by nails driven through the extensions. After the pipe is seated on the inner part the outer member is fitted into place and fastened with a couple of screws which pass through the foot extensions of both parts. When desired the outer part may be readily removed without disturbing the position of the inner part. Owing to the simple form of the two members, the hanger can be economically manufactured and the U-shaped form of the stock renders it very strong.

Heating and Ventilating School Houses

The second of a series of articles by C. E. Oldacre, Toronto, member American Society H. & V. E.

In the main corridor there are four direct steam radiators, each having 72 square feet of heating surface, or a total of 288 square feet of surface. These radiators are made up of eighteen sections each, of the two-bar type, and are 38 inches high. The valve is a 1½-inch angle radiator valve, having Jenkins disc. Each radiator is also provided with an automatic air valve. In the side hall there is placed a direct radiator of the two-bar type, having 60 square feet of heating surface, similarly provided with a 1½-inch angle radiator valve and automatic air valve. The radiators in the main hall are placed under the window sills and the one in the side hall just to the side of the entrance.

In each of the cloak rooms there are placed two rows of 1¼-inch iron pipe close to the floor, secured to the wall by hook plates. These coils go around three sides of the room and each one contains 24 square feet of surface. Above the coils at a suitable height are the racks for clothing, so the heat from the coils will dry out and warm the clothing during stormy weather.

The principal's room is heated by a 12-section two-bar radiator, 38 inches high, having 48 square feet of heating surface, and placed between the windows. It is provided with an 1¼-inch angle radiator valve and automatic air valve. The teachers and apparatus rooms each have 18-section two-bar radiators, 38 inches high, having 72 square feet each.

Each of the upper halls have two radiators of 40 square feet of heating surface, or a total of 160 square feet of surface.

The two dressing rooms for the assembly hall have each 48 square feet of direct radiating surface.

Heating the Assembly Hall.

The assembly hall, in addition to the indirect heating through two flues, each 24x30 inches, has two 15-section two-bar radiators, 38 inches high, each containing 60 square feet of heating surface, or a total of 120 square feet. The purpose of this direct radiation is to keep the room tempered at all times so that it may be quickly heated when required, through the indirect heating system. This affects a considerable saving in fuel cost, as one-third of the indirect radiators, amounting to 780 square feet of heating surface, can be kept closed off except when the assembly hall may be required. The direct radiation is closed off at such times as the assembly hall may be in use.

The play rooms have each 63 square feet of heating surface in wall radiation suspended by strong hangers from the ceiling. The wall radiators are made up of seven 9-foot sections and are provided with 1½-inch angle radiator valves and automatic air valves.

The two lavatories are provided with wall radiation similar to the play rooms the smaller one having 21 square feet of radiation, the larger 27 square feet.

The total direct heating surface is 1,090 square feet, disposed in 22 radiators, as detailed above.

The total indirect heating surface is 2,140 square feet, divided into eighteen parts. Each part is properly valved on the outside of the fresh-air room, having a 2-inch globe valve on the flow and an 1½-inch globe valve on the return pipe.

One and Two-pipe Systems.

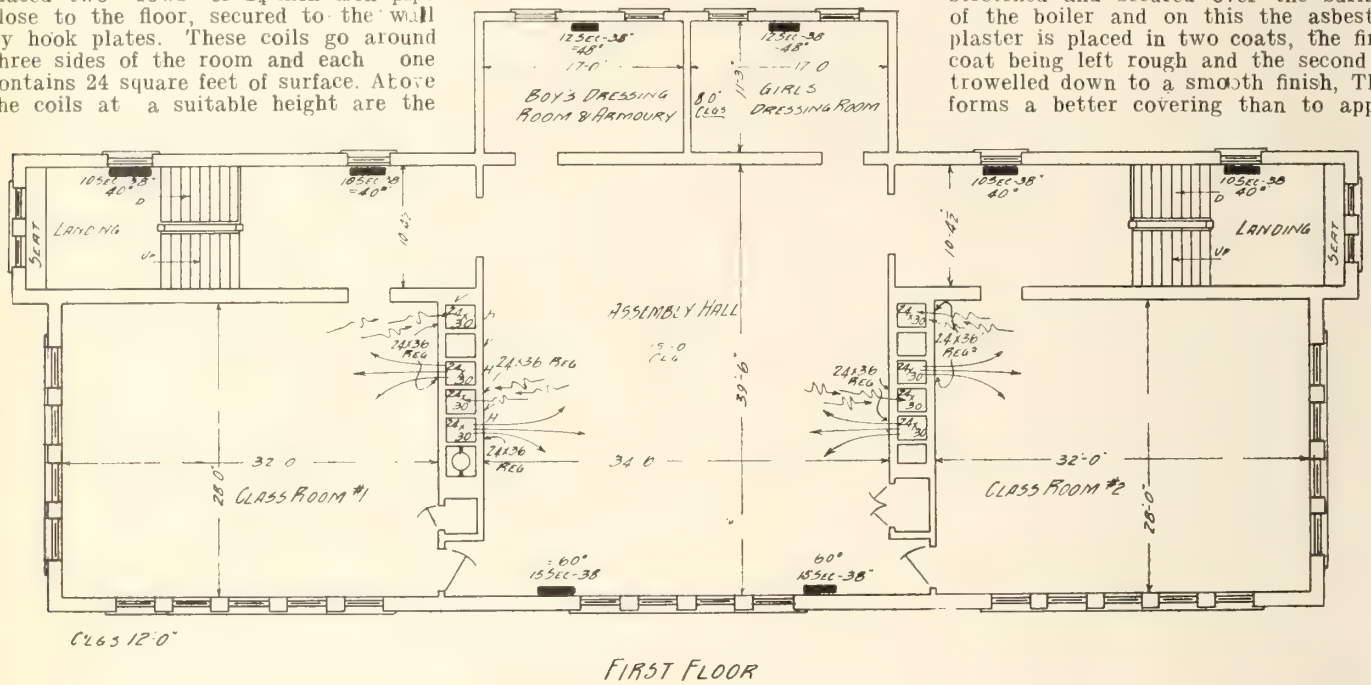
The direct radiation is arranged on a one-pipe system properly graded and dripped, while the indirect is arranged on the two-pipe system, as also are the coils in the cloak rooms. The returns are wet returns running under the cellar floor.

The boilers are of the cast-iron sectional type, having a capacity of 3,400 sq. feet each, or a combined capacity of 6,800 square feet of direct radiating surface. They are twined together and valved so that either one or both may be used at any given time. There is a great advantage in this setting, as in the moderate weather of early fall and late spring, one of the boilers will be found sufficient to accommodate the needs of the building during such a period. Each boiler is covered with a two-inch thickness of asbestos plaster. This coating is put on by first covering the boiler with woven wire, having a half-inch mesh. The wire is thoroughly stretched and secured over the surface of the boiler and on this the asbestos plaster is placed in two coats, the first coat being left rough and the second is trowelled down to a smooth finish, This forms a better covering than to apply the plaster directly to the boiler, as space between the plaster and boiler forms the best kind of a non-conducting medium.

Cast iron sectional boilers will be found more advisable for work of this class than wrought iron tubular boilers, as they are much less liable to corrosion during the period they are not in use than are the wrought iron boilers. They occupy less space and do not require as great a height, so that a pit is not required nor an extra height for the basement. Taking these items into consideration, a considerable saving is effected in the building cost.

Another consideration is that in case of repairs being required they can be made by the local steamfitter where cast iron boilers are used, which is very likely not to be the case where repairs are required for wrought iron tubular boilers, thus often avoiding delays and annoyances.

(To be continued.)



FIRST FLOOR

LAVATORY WASTE AND VENT CONNECTIONS

The accompanying illustrations from the Engineering Review show the various means employed in running waste and vent lines to lavatory fixtures located on a number of floors.

As seen, the majority of the illustrations deal with conditions affecting what is known as the half-S trap. The method of venting and running the waste and vent lines of the full S trap is, however, clearly shown in Fig. 1.

The branch vent from the fixture should have an upward pitch as it leaves the trap, which should be continued until it enters the main vent line, to allow any condensation that may form to drain into the trap. In order to obviate any possibility of waste from the fixture passing off through this vent, in the event of the stoppage of the trap or waste pipe, the vent should be connected into the main vent line at a point above the fixture.

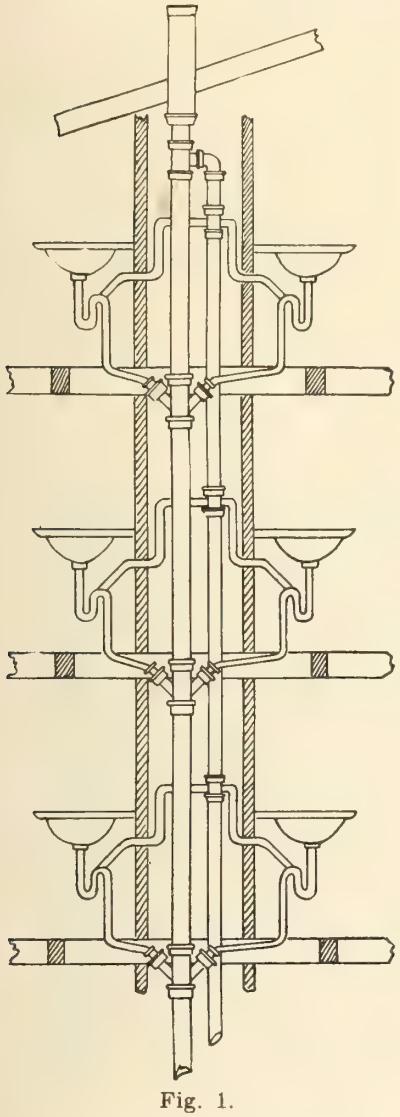


Fig. 1.

Where the vents of a group of fixtures connect into a main branch vent, it is good practice to run the main branch vent in such a manner that the lowest vent fitting shall be located two or three inches higher than the top of the highest fixture in the group.

The use of lead for vent work is being superseded by iron or brass for branch and individual fixture vents of two inches or less in size, while lead is used in connection with lead traps, with short connections to the iron or brass pipe.

A proper and economical method of connecting fixtures which are located on two floors, on the opposite sides of a partition, is shown in Fig. 2. Separate waste stacks are run to the fixtures on the different floors in this method of installation, the stacks being continued up to serve as vent pipes.

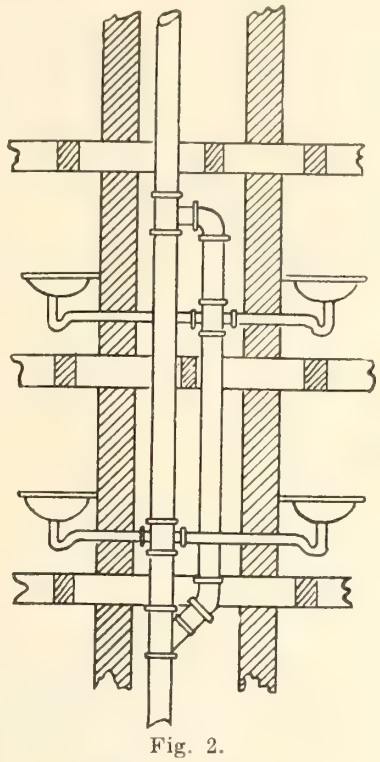


Fig. 2.

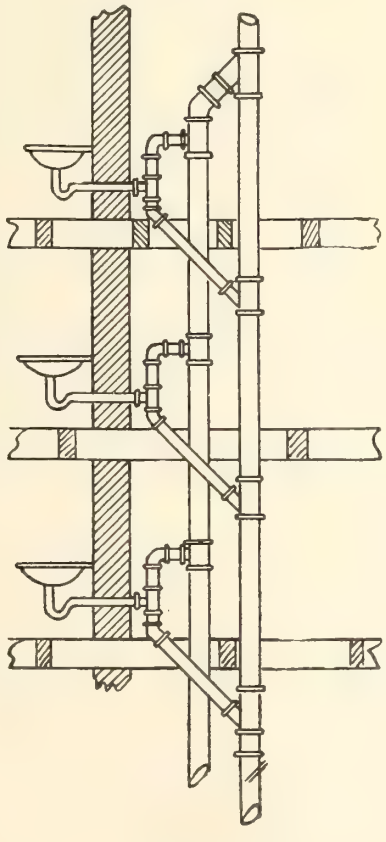


Fig. 3.

Attention is called to the manner of connecting the traps of the two fixtures on the upper floor. Connection is made into what would ordinarily be the main vent line, which in this instance becomes a waste below the fixtures and a vent above. By this arrangement, what would ordinarily be a waste stack becomes in reality a vent line for the fixtures on the lower floor, which discharge into it. This style of work can only be applied to two floors, since it would be necessary to discharge the fixtures on the third floor into either one of the two vertical stacks. In such an event, the stack employed as waste could not, of course, perform the duties of a vent line.

The provision of a system of vents for the purpose of supplying air to the fixture traps is made necessary in order that the seals of the trap may not be disturbed by siphonic action.

Objections have been raised to the usual system of trap venting with full S traps from the fact that a large number of vents have been found, at the end of a few years of service, to be nearly stopped up, and it is with the object of remedying this evil that the systems using the half-S trap, as shown in Figs. 2 to 5, have been designed.

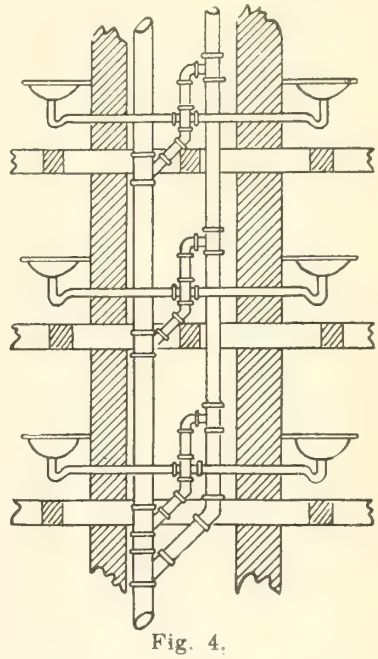


Fig. 4.

When the half-S trap is employed, it is customary to take the vent off the shortest leg of the trap and continue it horizontally to the stack. In work of this kind, stoppages of the vent openings have been found to be inappreciable in comparison with the other method.

Fig. 3 shows a method of running the waste and vent branches from the half-S trap attached to fixtures located on three floors. The method is clearly shown, the outlet of the trap being connected with a waste fitting, which is vented at the top.

Where the work is concealed, either cast or wrought iron is customarily employed, brass being used on exposed work. In all work of this character the vent is a continuation of the waste line.

Fig. 4 shows the same method employed as in Fig. 3, where double lines

of fixtures on the opposite side of a portion are installed. The same waste fitting receives the waste from each of two adjacent fixtures, a branch waste and vent being run from this fitting to the main waste and vent line.

Another method of installation for fix-

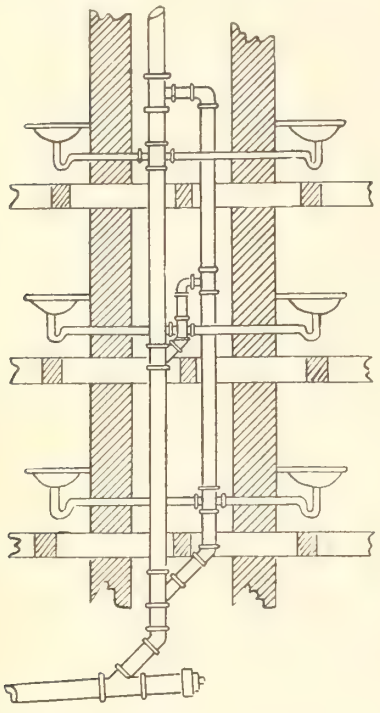


Fig. 5.

tures located on the opposite side of a partition on three or more floors is shown in Fig. 5.

The running of separate stacks to each floor, as shown in Fig. 2, would be too expensive and cumbersome. To obviate this, a soil and vent stack are run which are connected at the intermediate floors, a sanitary cross being used in the connecting branches. The wastes of both fixtures on the first floor are connected directly into the vent stack, which not only simplifies the construction, but cleanses the vent stack of rust scales or any foreign matter that might lodge there. On the top floor the waste stack receives the wastes from both fixtures.

An advantage in the methods of installation, as shown in the accompanying illustrations, lies in the fact that, with the exception of the short lengths of waste pipe from the fixture traps to the wall, all of the waste and vent pipes are concealed in the partition.

In addition, the manner of running the waste pipe from the fixture direct to the wall has the advantage of freeing the floor space beneath the fixture of pipes.

ECONOMICAL GAS BURNER.

The aim of an invention patented by A. G. Kaufman, New York, N.Y., is to provide a burner for use on cooking stoves, gas arms and the like, and arranged to insure a complete mixture of the gas and air, to produce an exceedingly strong flame, capable of quickly and highly heating culinary and other vessels, soldering irons, sad irons, etc., the burner consuming but little gas.

SHERARDIZING: THE NEW METHOD OF GALVANIZING

(From the Brass World, Bridgeport, Conn.)

The deposition of a coating of zinc on iron or other metals by means of the new process called "Sherardizing" is worthy of the attention of all those who are carrying on or contemplating galvanizing. This process is the invention of Sherard O. Cowper-Coles, of London, England, and has been in use in that country for some time with excellent results. It is, metallurgically speaking, one of the most interesting processes which have appeared in some time.

The process is a very simple one, and consists in heating the articles to be galvanized in a closed iron receptacle, such as a tumbling barrel, with zinc dust. At the same time the barrel is heated to about 600 degrees Fahrenheit. This temperature need not be exact, and from 500 to 600 degrees answer the purpose. The thickness of the coating depends upon the length of time that the articles are allowed to remain in the barrel. Any desired thickness may, therefore, be obtained.

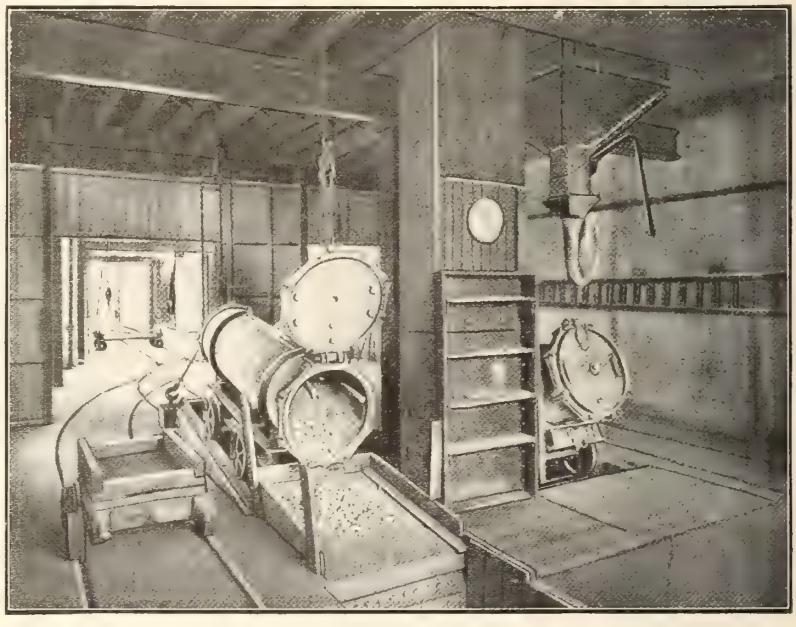
The castings are cleaned in any desired manner, either by pickling, tumbling, or the sand blast. This part of the process is the same as it would be for ordinary galvanizing or electrogalvanizing. They are then placed in a closed iron drum or barrel, which is so made that it may be revolved and heated by a muffle furnace or other means. In the illustration the drum and the method of heating it are shown. The articles, after they have been treated, are shown issuing from the drum. When the articles are placed in the drum, a quantity of zinc dust is placed in with them. This zinc dust is a commercial article, and may be cheaply obtained.

The process is based upon the fact that zinc volatilizes in an inert atmosphere at a temperature slightly below its melting point. The volatilized zinc, therefore, unites with the iron or steel (brass or copper may also be used) and forms an alloy with it. This allows it to adhere tenaciously. The zinc then continues to cover the surface until any desired thickness may be obtained. When finished, the articles are dumped out, sifted from the zinc dust, and are in a completed condition unless a highly polished surface is desired.

Material galvanized by this process has withstood five years of the most trying conditions. It has been found satisfactory to the British Admiralty, and also by the Colonial Government of the Gold Coast, where nothing but gunmetal or brass would withstand the severe conditions of the climate.

Tests which have been made of it by standard methods, or that known as the American telephone and telegraph test, resulted in a victory for articles that had been sherardized. Four dips in a sulphate of copper solution are required by this test, with a dry-wiping at each immersion. Many of the samples of material galvanized by the hot process broke down after these four immersions, but the sherardized samples stood ten immersions without injury.

The polished surface of sherardized articles resemble those which have been nickel plated, and have the advantage that they will not peel. The method, therefore, may be used for producing ornamental work.



Sherardizing Apparatus in use at Works of London Sherardizing Works, Willesden Junction, London, Eng.

There are many advantages of sherardizing which at once become apparent when the process is used. Some of them are as follows :

1. The zinc forms an actual alloy with the exposed metal and renders it far more difficult to corrode than ordinary galvanized articles. The coating has less tendency to peel on this account.
2. There is no zinc dross produced.
3. The plant may be started within a few minutes, and does not require the

melting of a large mass of zinc, as in hot galvanizing.

4. No fumes are given off.

5. The thickness of the coating may be varied if desired.

6. An even coating of zinc may be contained on articles, no matter what their shape is. This is impossible when dip galvanizing is used.

7. Skilled labor is unnecessary.

8. Sherardized surfaces are harder than those which have been galvanized in the ordinary way.

9. The threads of screws or similar indented portions of articles are not filled up.

10. Sherardized articles may be soldered, painted, or otherwise treated.

Although sherardizing has been carried on in England and other countries, it has only recently been introduced into the United States. The United States Dry Galvanizing Company, of 34 Pine street, New York city, are the American agents for the process. A small plant is now being operated in New York city, and another is in process of construction in New Jersey. The illustration herewith shown was taken at the English works of the London Sherardizing Company, Willesden Junction, London.

STANDARD METHODS IN GAS APPLIANCES AND HOUSE FITTING

Extracts from paper read before the Iowa District Gas Association recently by G. T. Vincent.

The bulk of gas appliances consists of stoves and water-heaters, and even in these the variety prohibits standardizing but does not admit of general rules.

Sixty feet of ¾-inch pipe will deliver about 100 cubic feet of water gas per hour with 0.3-inch drop in pressure, or of about 110 cubic feet of coal gas. As an ordinary double oven range will use 100 cubic feet of gas an hour, all on, nothing under ¾-inch pipe should be considered for connecting gas ranges. Further, when it is considered that water-heaters, when installed are connected to the stove line, it is a question as to whether a one-inch pipe would not be better, particularly for long runs. It is conceded that a uniform size for all lengths is the most preferable, and as the difference in cost between ¾-inch and inch pipe is only a trifle over one cent per foot, there seems to be a fairly good argument for using 1-inch pipe exclusively.

Where it is necessary to drip the gas stove line away from the meter, it should be equipped with a grip at the lowest point made from the nipple 6 inches long, and provided with a hose cock or other small opening cock, and

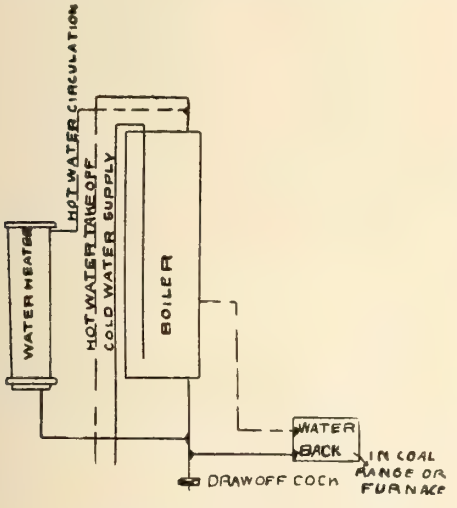


Fig. 1.—Connection for Circulating Water Heater to Vertical Boiler.

not with a cap or plugged coupling. The drip should only be installed in a place readily accessible and protected from freezing.

The question of installing a shut-off cock with each appliance is an open one; also the location of the cock if installed. The one argument in favor of a cock is

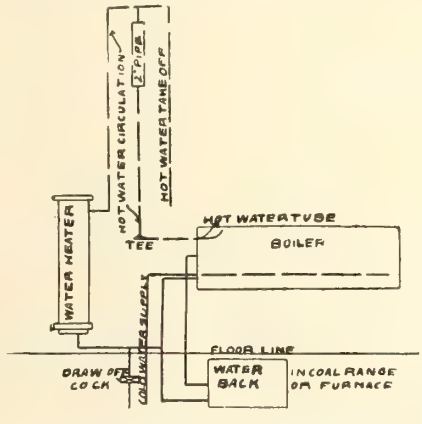


Fig. 3.—Connection for Circulating Water Heater to Horizontal Boiler When Heater is above Boiler.

the means given to control the gas in case of accident to the appliance or to make repairs. Any cock should, therefore, be placed at the appliance and not at the meter. As a general proposition, it is good practice to install cocks on all industrial appliances and omit them on domestic appliances, the argument against their use in the latter case being briefly the additional expense and danger of misuse by the consumer with possibility of exploding the appliance.

Gas stoves with back flue outlets should not be placed closer than eight inches to a wall. In disconnecting stoves the riser through the floor should be screwed out and the line plugged below. This is to prevent possible injury to occupants by tripping over the pipe.

The appliance next in importance to the gas stove, is the water-heater. While water-heaters are of two classes, circulating and instantaneous, with two types of the latter the same general rules for connecting apply to each.

The connection should be directly from the meter. Circulating heaters can generally be connected to the stove line. If there is none in use, one can be installed for the heater connection and the stove connected later. Instantaneous heaters of the pressure type, such as the

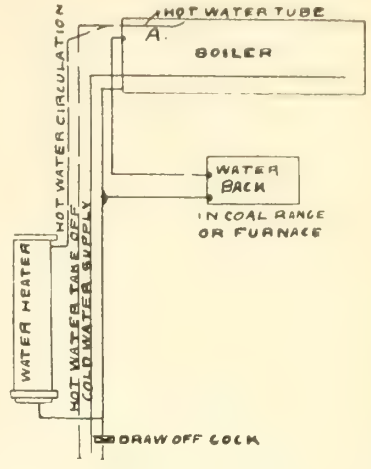


Fig. 2.—Connection for Circulating Water Heater to Horizontal Boiler.

Ruud and Monarch, should be connected with the size pipe given by the manufacturers, but never with less than ¾-inch. Instantaneous heaters of the open type should have a direct line not less than ¾-inch. The connection of any type to an outlet will usually result in trouble. The flue pipe of all heaters should be run to the chimney or outdoors. The practice of ending the flue pipe in a disused room, or garret, or cellar way, is a poor one and saves very little in the installation. All water pipe and fittings should be galvanized and of the size called for by the manufacturer, but never less than ½-inch.

Circulating water-heaters occasionally present some difficulties in their installation, and it seems to be quite usual to decline to connect them to horizontal boilers of any type. This is unnecessary loss of business, as a circulating heater can be made to give results with any kind of boiler in any location.

Fig. 1 shows a standard connection to a vertical boiler. Fig. 2 shows a standard connection to a horizontal boiler when the heater can be set below the boiler. This requires usually the insertion of the bent hot water tube A. Fig. 3 shows a connection to a horizontal boiler when the heater is placed above the boiler. This method is used where the boiler is low and should be used in preference to setting the heater in the cellar or basement, where it would be subject to freezing.

LATE ALREADY.

Five minutes after the tardy gong had struck the principal of the school was walking through the lower hall, when he saw a pudgy little fellow scampering toward the first-grade room as fast as his fat legs could carry him. "See here, young man, I want to talk to you," called the principal to the late comer. "I hain't got time to talk to you; I'm late already," replied the breathless beginner as the door of his class room closed.

NEWS OF THE TRADE IN CANADA

H. H. Desautels, plumber, Montreal, has assigned.

Clinton, Ont., has passed a bylaw for $53,000 for waterworks.

H. A. Gauthier & Co., plumbers, Montreal, have made an assignment.

Hurtuboise & Page, plumbers, Montreal, have dissolved partnership.

The Dominion Government will spend $400,000 in improving Toronto harbor.

Joseph Lemarche, one of Montreal's best known plumbers, recently assigned.

The plumbing firm of Quimet & Galarneau, Montreal, have dissolved partnership.

Carleton Place, Ont., is to vote on a bylaw to borrow $25,000 to establish waterworks.

T. Bissonnette & Sons, Levis, Que., have registered to do business as plumbers and steamfitters in that city.

The new galvanizing plant of the Winnipeg Galvanizing and Manufacturing Co., has commenced operations.

Shipments of machinery have arrived for the Sarnia Brass Works. The company will manufacture plumbers' supplies.

Fred Armstrong & Co., Toronto, will install a new ventilation system at the Toronto Model School. Their tender is $4,000.

The Town Council of Carleton Place, Ont., is considering the presenting of a by-law to borrow $25,000, to establish waterworks.

The Western Heating & Plumbing Company are installing baths, sinks and lavatories in the Western Hotel, Saskatoon, Sask.

The City Council of Port Arthur, Ont., will erect a large power plant at Silver Falls. The capacity at present will be 6,000 horse-power.

The Page-Hersey Iron & Tube Company, Welland, have awarded the contract for a large mill to the Berlin Construction Company, Berlin, Ont.

W. E. Forbes, Richigucto, N.B., has completed the work of remodelling the interior of his store building. The work included the installation of a hot-water heating system.

The contract for the new Roman Catholic church to be built in Peterboro has been awarded to Langford & Sheehy. The tenders for the electrical wiring, plumbing, etc., will be let at a later date.

The London Brass Works Co. will erect a large new factory in the east end. The president, ex-ald. Armstrong, has also decided to erect a number of cottages on the property for the use of his employes.

Fire, believed to have been caused by defective electric wires, damaged the tool-house of the James Morrison Brass Manufacturing Company's works, Toronto, last week, to the extent of $2,000, with full insurance. There will be no interruption to business.

The John Lewis Company, Belleville, Ont., have completed the heating and plumbing for the House of Refuge and the work has been taken over by the county officials, who were highly pleased with the job.

The Toronto Brass Mills, Limited, have been incorporated by A. E. J. Blackman, Arthur Munro, J. E. Fennell, A. J. Algate and C. Henderson, all of Toronto. The company is capitalized at $500,000 and will establish mills for treating brass in all its manufactured forms.

The Ideal Manufacturing Co., Detroit, Mich., and Windsor, Ont., have placed another representative on their Canadian territory. L. K. Markey, who until the present, has been the company's sole Canadian representative, will still call on the trade, but hereafter will confine his attention chiefly to the larger centres.

An accident occurred at the Oshawa Steam & Gas Fitting Company's works recently wherein one man was instantly killedl and several others seriously injured. Owing to the weight of castings which were stored on the second flat, the floor gave way, emptying the tons of small fittings onto the men working at machines on the ground floor. Harvey Perkins, a young married man, was dead when removed from the wreck.

The following contracts in Belleville, Ont., and vicinity were recently completed by the W. W. Chown Co., of that city. Two boilers for a hot-water heating plant in the Kyle House, replumbing of Albert College; complete system of plumbing in residence of George A. Bennett, chairman of the Board of Education; system of hot-water heating in residence of Dr. Drupiem, and also in residence of J. A. Howell, in Redversville; plumbing and hot-water heating in residence of Byron May; plumbing and hot air heating in residence of George F. Stewart, of Deaf and Dumb Institute.

NEW STYLE OF WATER PIPE.

Vancouver waterworks officials believe they have found an ideal pipe for use where large mains are necessary.

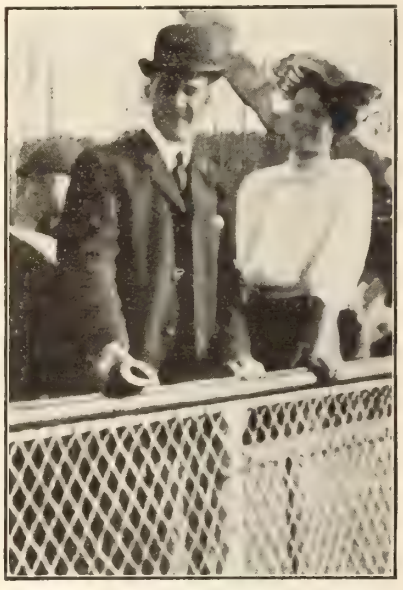
"When we drew up the specifications for this pipe," said Engineer Burwell, "we purposely left the classification rather vague. We thought that possibly there was some kind of pipe which we were not acquainted with, and wanted to get the very best on the market for the purpose. These specifications were sent to all parts of the world, and the tenders showed that a Glasgow firm had won out on price.

"The pipes are made from soft steel, and lap welded by an electrical process. This makes it possible to tap the main itself instead of putting in special lengths. The welding finish leaves a perfectly smooth surface within, a point of great value, when the capacity of the main is considered. The thickness of the metal is above the specifications, and it is predicted that it will stand a pressure far beyond the demands."

The waterworks officials formerly depended upon riveted pipe for these large mains, but this new type is much superior. In a riveted pipe there is always considerable loss in capacity, through friction, and it is estimated these new pipes will have fully 20 per cent. advantage over the old style in this line. Then these new pipes are bell-jointed, obviating the necessity of bands at each joint, and saving a large amount of lead in completing the main. Each joint of a riveted pipe takes a hundred pounds of white lead, while the new type will only take thirty pounds for each joint.

B. C.'S VICE PRESIDENT.

In the accompanying illustration readers of The Plumber and Steamfitter are introduced to the National Plumbers' Association's vice-president for British



B. C.'s VICE-PRESIDENT.

A. C. J. Weeks, Vancouver, Vice-president for B.C., in the National M. P.A., in Good Company on a Boating Trip.

Columbia, A. C. J. Weeks, of Weeks & Co., Limited, Vancouver. The picture was taken when leaving Vancouver Island on a holiday trip last summer. Miss Weeks, who accompanied him, wears a pleasant smile and both look as though they had enjoyed their visit.

Mr. Weeks expects to visit Toronto and other Eastern Canada cities during the coming winter.

E. J. Evans, Toronto, will erect a hotel to cost $18 000.

The Canadian Birkbeck Investment & Savings Co., Toronto, will erect an office building to cost $120,000.

J. B. O'Brien, Toronto, will erect a residence to cost $30,000.

PLUMBING AND HEATING MARKETS

TORONTO MARKETS.

Toronto, Nov. 5.—An active autumn demand prevails throughout the local plumbing and heating markets and November business has started out at a good clip. Though strictly local trade is not as brisk as jobbers would like to see it, nevertheless, it is surprisingly good—considering the labor troubles which have beset these markets all summer—and any lack of urban trade is more than offset by the volume of orders daily arriving from outside points. In sympathy with the prevailing low price of copper, brass goods show a disposition to decline, but, as a large proportion of jobbers' present stocks were bought at the old figures, it will take some time before the market for finished products adjusts itself to the prevailing low price of the metal in the world's primary markets of supply.

Iron Pipe—There is no noticeable improvement in the supply as far as jobbers are concerned and many complain that the scarcity in some sizes is more marked than ever. The lamentable scarcity of rolling stock on the two large Canadian railways serves to augment the trouble by making pipe deliveries extremely slow and uncertain. Half-inch galvanized, and other popular plumbers' sizes cannot help but be scarce for the balance of the year at least, though the producers say they are now able to secure a better supply of skelp and that they are doing all within their power to cope with the situation. Prices are firm as follows : ½-in. black pipe, $2.90 ; ½-inch galvanized, $3.75 ; 1-inch black, $5.60 ; 1-inch galvanized, $7.25.

Soil Pipe—Since the sharp advance reported a fortnight ago there has been no further change in quotations and prices remain firm at the advanced figures. There is a strong autumn demand. Present prices are : Medium and extra heavy pipe and fittings, up to 6-inch, 70 per cent.; 7 and 8-inch pipe, 40 per cent.; light pipe, 60 per cent.; fittings, 60 per cent.

Lead Pipe—The demand cannot be said to be brisk, though it is satisfactory for this time of the year. Lead pipe is still quoted at 5 per cent. off list.

Solder—November business has opened up well. Wiping solder is quoted at 21c, and half-and-half at 23c per pound.

Radiators and Boilers—A heavy call exists for radiators and manufacturers are so crowded with orders that they cannot guarantee the prompt shipment which jobbers expect. Radiator prices are firm and unchanged. Business in boilers is good, with supplies well up to orders. Boiler prices have not changed during the past fortnight, the discounts still remaining at 50 to 50 and 10 off list.

Brass Goods—Prices show a tendency to weaken though the present demand continues strong. Compression work is quoted at 60, and basin cocks 55 per cent.; fuller work is held at 65 per cent. off list. Ground work quotations run as follows : Bibbs, 45 ; roundway, 50, and flatway work, 50 and 10 per cent.

Enamelware—All classes of enamelware are in strong demand, and November business promises to be heavy. For baths, as well as other enamelware, the September price list is still being adhered to.

MONTREAL MARKETS.

Montreal, November 4th The consensus of opinion among the plumbing and allied trades is that business generally is very satisfactory. The increasing coldness of the weather, combined with the great activity in the building trade keeps the demand at good pressure, and the manufacturers are satisfied. Despite the stringency of the money market, and the after effects of the Wall Street panic, collections generally are good. There is an optimistic tone prevailing all the way along the line and confidence is expressed that this satisfactory state will continue at least until the end of the year.

Brass Goods.—The strong demand of the last few weeks still continues. Contrary to outside expectations, the low price of copper has not affected prices on brass goods to any slumping stage as it were. The manufacturers were well stocked at the high price obtaining some time ago, and therefore, as yet, are not cutting to any great extent. There has been a reduction in some lines, but up to now prices have been well maintained considering the situation. The demand continues good for fittings. There is a slight change in brass values from 5 to 10 per cent. In some lines there is a disposition to wait to see how copper will go, but generally speaking the trade demand is good. We quote standard compression work 57½ to 60, and fuller work, 70 per cent.

Enamelware—There is no change in the situation. The flourishing state of the building trade makes things good all the way round, and the factories are working at satisfactory pressure. The outlook is promising.

Radiators—Owing to the cold weather the demand continues to keep up. Collections which were somewhat slow are now better, and prices are steady.

Hot Water Boilers—There is a fair demand for goods and the seasonableness of the weather is keeping things in a satisfactory state. Collections are likewise improving.

Iron Pipe—Prices are unchanged and the factories are still working at full tension. The supply has not yet caught up to the demand.

Lead Pipe—Prices are firm, and the condition of the market has not changed.

Metals—Prices have changed but little, and the demand for most lines continues good. Bar lead still remains at $5.75, while pig lead is $5.25; pig iron is steady at $21.50 for Middlesboro No. 1, and $20.50 for No. 2; Summerlee is unchanged; ingot tin, $36.50 to $37; ingot copper, 17 to 18c; sheet zinc, $7 to $7.25. There is no change in heavy red scrap brass, or yellow brass; scrap zinc has declined a little, being now 3c; No. 1 wrought iron, $14.50 and No. 2, $6.

The West End Baptist Church, Halifax, N.S., was destroyed by fire, the loss being $10,000.

CONDENSED OR "WANT" ADVERTISEMENTS.

RATES.

Two cents per word first insertion ; one cent per word subsequent insertions.

Five cents additional each insertion where box number is desired.

Contractions count as one word, but five figures (as $1,000) are allowed as one word.

Cash remittances to cover cost **must** accompany all advertisements. **In no case** can this rule be overlooked. Advertisements received without remittance cannot be acknowledged.

RULES FOR COPY.

In addressing replies care of PLUMBER AND STEAMFITTER don't fail to give box number.

Replies addressed to PLUMBER AND STEAMFITTER boxes are re-mailed to advertisers every Monday, Wednesday and Friday.

Requests for classification will be followed where they do not conflict with established classified rules.

Orders should always clearly specify the number of times the advertisement is to run.

All "Want" advertisements are payable in advance.

FOR SALE.

PLUMBER'S Cabinet for sale, cost $75, stands nine feet high and is 6 feet wide, contains 68 drawers, ranging in size from 3 in. x 3 in. to 6 in. x 18 in. Am installing larger cabinet, otherwise would not think of selling. Box 649, Plumber and Steamfitter, Toronto.

BUSINESS CHANCES.

OFFICE space wanted by manufacturer in Toronto : state location and terms. Box 645, Plumber and Steamfitter, Toronto.

SITUATION VACANT.

WANTED—A salesman familiar with plumbing supplies and gas ranges, to represent a Canadian manufacturer direct to the wholesale and retail trade; must have acquaintance with the trade; best of references will be expected ; give full information concerning experience, acquaintance with the trade, salary expected ; good position for the right person. Only hose who can fill the above qualification need apply, Box 639, Plumber and Steamfitter, Toronto.

THE WANT AD.

The want ad. has grown from a little used force in business life, into one of the great necessities of the present day.

Business men nowadays turn to the "want ad." as a matter of course for a hundred small services.

The want ad. gets work for workers and workers for work.

It gets clerks for employers and finds employers for clerks. It brings together buyer and seller, and enables them to do business, though they may be thousands of miles apart.

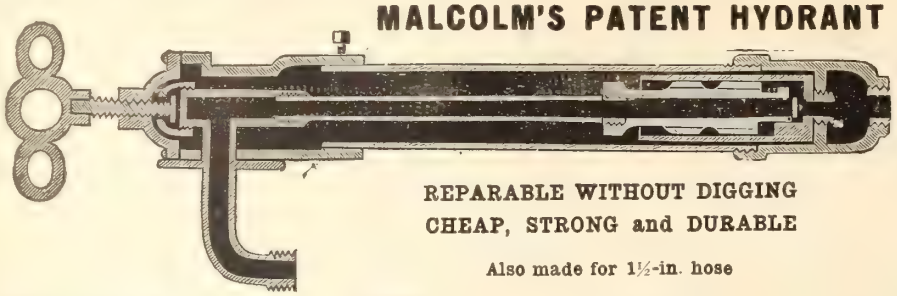
The "want ad." is the great force in the small affairs and incidents of daily life.

The new building for the Montreal Sailors' Institute will cost $60,000.

The I.O.O.F. lodge, of Hamilton, will improve their hall at a cost of $10,000.

The contract for the new armory for Medicine Hat, Alta., has been awarded to A. Burns, of that city. The cost is $160,000.

MALCOLM'S PATENT HYDRANT



REPARABLE WITHOUT DIGGING
CHEAP, STRONG and DURABLE

Also made for 1½-in. hose

MALCOLM & CO., TELEPHONE MAIN 5101 **64 Lombard St., Toronto**

Any Boy Who Has 1 Cent Can Turn it Into

$ 10 $

One cent invested in a post card to us will bring you information about how we can start you in business, so that you can earn money for yourself. You can make plenty of pocket money all the time—money you will enjoy the more because you made it in business for yourself. Hundreds of boys are doing this. ***SO CAN YOU.***

NO MONEY REQUIRED——————WE FURNISH CAPITAL

We also give prizes. There is a prize for every boy whether he lives in a large city or a little village. Very fine prizes have gone to fellows in small places. Don't delay a minute. Write us to-day. A post card will do.

THE MACLEAN PUBLISHING CO. Limited
10 Front Street East, TORONTO

Backed by a Guarantee

All our **Bronze** Powders and **Liquids** have the distinction of being **Guaranteed.** All plumbers and Steamfitters know the necessity of having the **Best** in Bronze Powders and Liquids.

OURS NEVER FAIL

The Canadian Bronze Powder Works, Montreal & Toronto

No order too large **Works at Valleyfield** If your nearest dealer does not handle our goods, write us.

INSTALL THE

ONLY BRASS GOODS

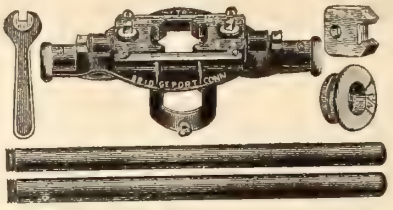
MADE

GUARANTEED 5 YEARS

They make good customers

Glauber Brass Mfg. Co.

CLEVELAND, OHIO, U.S.A.



The Armstrong Manufacturing Co.

317 Knowlton St., - Bridgeport, Conn.

Manufacturers of the Genuine Armstrong Stock and Die, Malleable Iron Hinged Vises, Pipe Cutters, Pipe Wrenches, Bard Adjustable Bushings, Ratchet Attachment for Stock, Pipe Threading and Cutting-off Machine--Hand and Power. Our goods are sold by all Jobbers.

CATALOGUE MAILED ON REQUEST

If you can use High-grade Low Down Compression Basin Cocks with China Index Handles, ask for the Acme Brass Works Nos. 4, 5, 6 and 7 Basin Cocks, which are just what you want. They are the acme of perfection in style, workmanship and durability.

Write us to-day.
Do not delay for to-morrow.

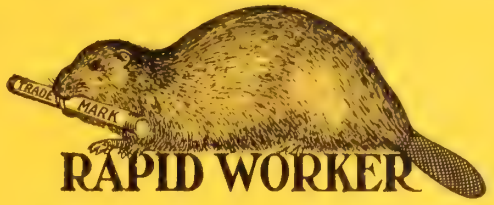
Acme Brass Works

CLEVELAND, O.

Let Our Beaver Do Your Work.

You Don't Have to Change Dies.

Cuts 1, 1¼, 1½ and 2″ perfect threads, all with one set of chasers



RAPID WORKER

The Hand Stock that Starts Easy and Finishes Easier.

"The New Way."

You Will Find it a Sure-enough Beaver.

Write for our special 10-day trial offer

You cannot afford to take the time to thread pipe by hand in any other way

Other sizes of Beavers will soon be born—¼ to ¾—2½ to 4—4½ to 8—8 to 12

Manufactured by

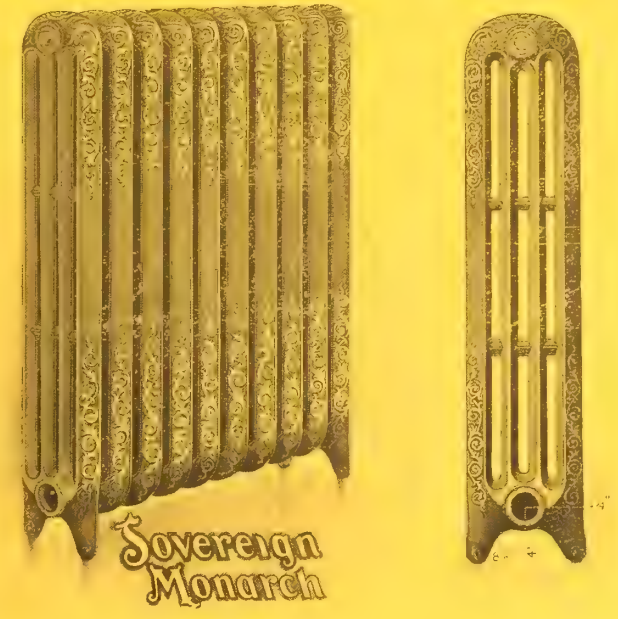
Borden=Canadian Company

166 Adelaide Street West, Toronto

In Your Heating Tender Specify

"Sovereign" Radiators

The contractor who specifies the "Sovereign" Radiators is sure of both profit and reputation. We never ship a defective article. Every "Sovereign" is sound and well-tested, has a larger connection with the feed pipe, and a greater heating surface to the loop, than any other radiator made. This means a satisfactory performance of the contract terms with its consequent result of good feeling.



TAYLOR-FORBES CO., Limited

Head Office and Works: GUELPH, ONT.

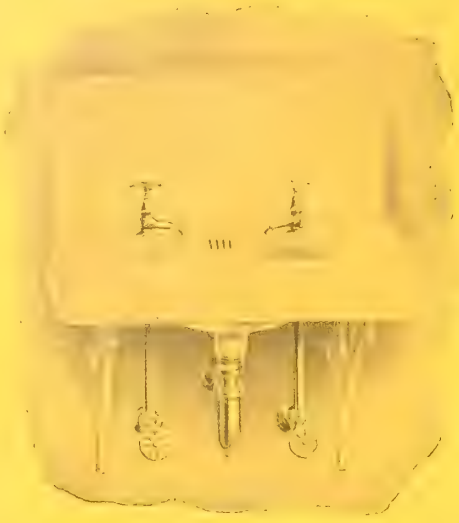
TORONTO—1088 King Street West.
ST. JOHN, N.B.—H. G. Rogers, 53½ Dock St.

MONTREAL—122 Craig Street West.
QUEBEC, QUE.—The Mechanics Supply Company

WINNIPEG—The Vulcan Iron Works, Limited.
VANCOUVER, B.C.—Boyd, Burns & Company

Architects, Builders and Plumbers

freely endorse



Standard Ideal Porcelain Enameled Ware

Dealers handling Standard Ideal Ware are assured of larger sales, better satisfaction and greater profits. Manufactured in Canada, this ware is the equal of any foreign product of a like nature.

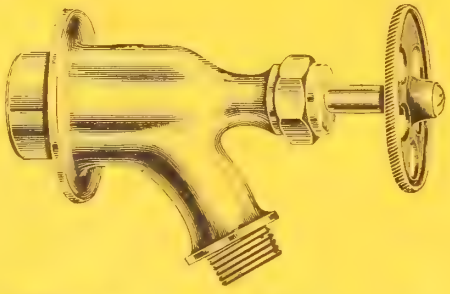
We manufacture Bath Tubs, Sitz Baths, Shower Baths, Sinks, Lavatories, Urinal Ranges, Slop Hoppers, Laundry Tubs, Closet Ranges, Steamship Supplies, Railway Car Supplies, Hospital Appliances, etc.

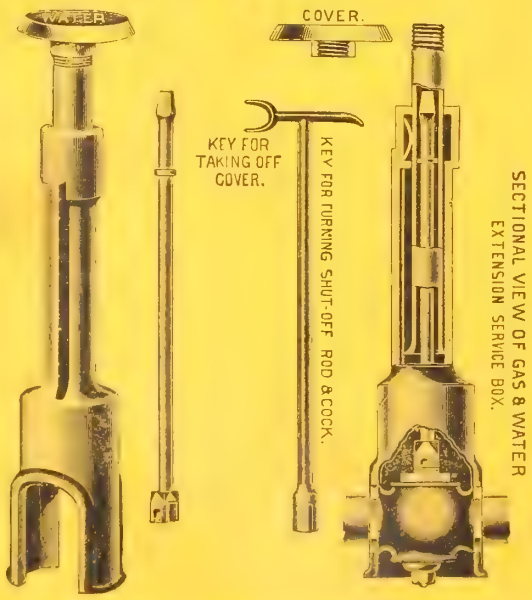
THE STANDARD Ideal COMPANY LTD.

Head Offices and Factories, - PORT HOPE, Ont.

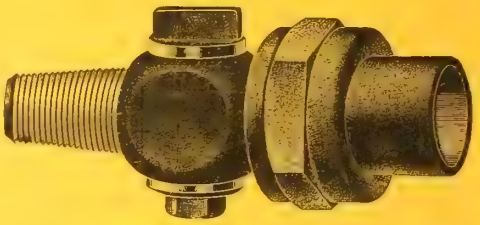
Sales Offices and Sample Rooms: TORONTO, 50 Colborne St. MONTREAL, 128 West Craig St. WINNIPEG, 156 Lombard St.

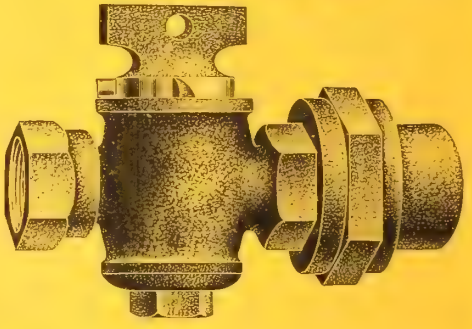
(517)





Fittings That Don't Disappoint





For

Plumbing, Water, Gas and Steam

Hays Manufacturing Co.

Complete Works: - - - ERIE, PA., U.S.A

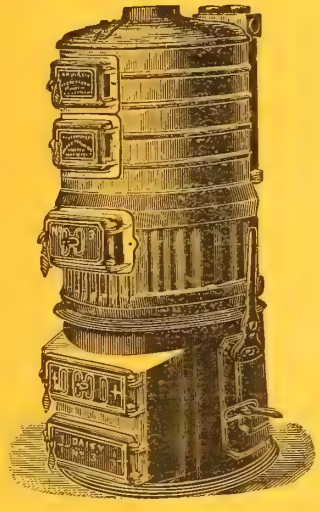
PLUMBER & STEAMFITTER OF CANADA

THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

MONTREAL, 232 McGill St. TORONTO, 10 Front St. E. WINNIPEG, 511 Union Bank Bldg. LONDON, ENG., 88 Fleet St. E.C.

Vol. I. No. 16. (New Series). Publication Office : 10 Front St. East, TORONTO, NOV. 20, 1907. Old Series, Vol. XIX. No. 26

THE DAISY STANDS ON ITS MERITS



We claim a great many things for the DAISY HOT WATER BOILER—that it is the oldest heater manufactured in Canada — that it is giving universal satisfaction — that there are more of them in use to-day than all other makes combined —but what we assert the strongest is that genuine merit has been the secret of the DAISY'S unprecedented popularity.

A FEW OF THE FINE POINTS.

Quality of metal, practical design and high grade of workmanship.

Horizontal circulation.

The perfect grate, combining strength with easy shaking and dumping the ashes.

Write for Catalogue.

Our stock of Steamfitters' and Plumbers' Supplies covers the largest range in Canada. We make every effort to ship orders sent by mail the day they are received.

CLUFF BROTHERS

LOMBARD STREET, TORONTO

SELLING AGENTS FOR WARDEN KING & SON, Limited

The James Robertson Co.

LIMITED

TORONTO AND MONTREAL

Cheap Polishes, Soap Cleaners, Powders, Acid and Alkali Mixtures, etc., will ruin fine plumbing outfits. See below what is said of "KING POLISHINE" Powder and the many uses for which it is commended. It is an indispensable article in the home and every building; quick, surpassing results, harmless in every application, and the most economical Burnisher and Cleanser to be found. Read the "One Dozen Good Reasons" why Master Plumbers should recommend and sell

"The King Polishine"

What is the difference or advantage in using "THE KING?"

1st.—It is odorless.
2nd.—It contains no acid.
3rd.—It contains no alkali.
4th.—It contains no grit, does not scratch.
5th.—Is an antiseptic.
6th.—It is not inflammable.
7th.—It does not evaporate or lose strength.
8th.—It does not injure the hands.
9th.—It is cleanly to handle, no smeary, greasy, ill-smelling mess, when applied to glass, metals, etc.
10th.—It cleans your windows, etc., in one-tenth time that can be done by water or any other cleaner.
11th.—One gallon will go as far as five gallons of any other cleaner known.
12th.—Best of all! By mixing one pound of "THE KING" with a gallon of water you make the cheapest polish ever used.

You sell it under the guarantee that it will do the work as represented or the price will be refunded.

ONE TRIAL WILL DEMONSTRATE THE SUPERIORITY OF

"The King"

RESTORES UNSALEABLE GOODS TO THEIR FORMER BRIGHTNESS.

SEND A POST CARD FOR A SAMPLE PACKAGE.

THE MOST GRATIFYING RESULTS IN LABOR-SAVING AND EXPENSES.
A PLEASURE TO USE IN ITS SUPERIOR EFFICACY.
A PROFIT IN ITS ECONOMY OF TIME AND EXPENSES.

The James Robertson Co.

LIMITED

TORONTO AND MONTREAL

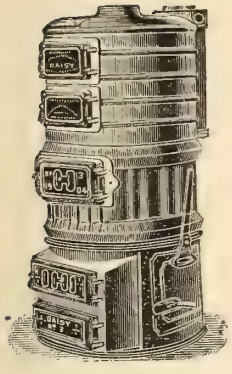
METROPOLITAN CLOSET OUTFIT

BEST COMBINATION
IN THE WORLD.

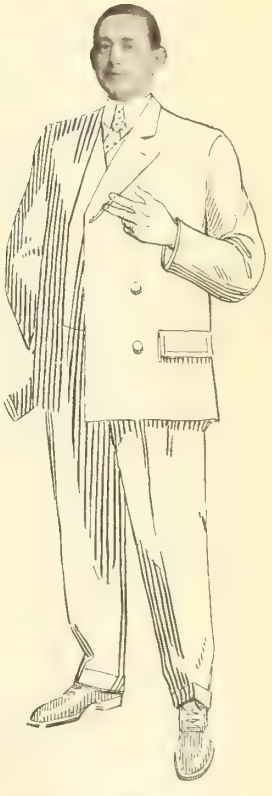
SOMERVILLE LIMITED

59 RICHMOND STREET EAST - TORONTO

Honest Ratings



The ratings of the Daisy Boiler are thoroughly honest and conservative. Every size has been carefully tested and its power accurately estimated, so that in figuring, the steamfitter is positive in gauging boiler capacity according to the published ratings. You will not be obliged to take out a Daisy.



Write for Catalogue.

CLUFF BROTHERS

Lombard Street, TORONTO

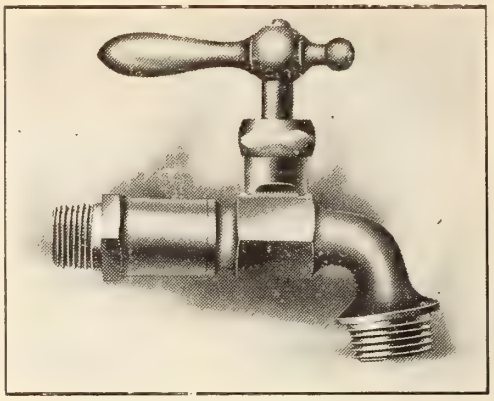
Selling Agents for WARDEN KING & SON, Limited

WE MAKE A

FULL LINE

— OF —

Plumbers'



Brass Goods and Quick Opening Valves

and are now in a position to make prompt shipments. **Make special note of the fact** that all our goods are fully tested. This means a lot to you—a saving in time and temper. The trade appreciate **"Monarch" Cocks.**

The Monarch Brass Mfg. Co., Limited

Factory, Port Colborne

Office and Warehouse - - - - 278 Dundas St., Toronto

Mueller

FITSEMALL

FITSEMALL

(Patented)

Where the Roads Divide

Where roads divide it is natural to pick out the one that gives easy sledding. You have had plenty of hard sledding making some bath supplies fit bath cocks, but there is a divide in the road now which leads to

Mueller Fitsemall Bath Supplies

and gives you easy sledding. They fit any bath cock, but the nuts of the cock must be used with them. Note the lead cone bearing. It conforms exactly to the openings in the bath cock, making a tight joint. Floor flanges always furnished. Prices on application. Unconditionally guaranteed.

TRADE MARK MUELLER REGISTERED

H. MUELLER MFG. CO.

Eastern Division
NEW YORK CITY
254 Canal St., Cor. Lafayette.

Works and General Offices
DECATUR, ILL.
West Cerro Gordo St.

KNOWLEDGE IS POWER

THE SUCCESSFUL PLUMBER is the man who takes an interest in life outside the plumbing business. He is the man who is capable of applying general knowledge, whether gained from reading or otherwise, to his business. It is his capacity to apply this general knowledge to his business that puts him in the **REALLY SUCCESSFUL CLASS.**

How is the average merchant to acquire a general knowledge of affairs. He has not the time necessary to search all the various magazines and periodicals for what interests him. Must he trust to one or two publications and miss the many which do not come his way?

NO. There is a method by which he can procure the interesting, timely and instructive articles appearing in every publication, both on this side of the Atlantic and the other. The Editorial Department of

THE BUSY MAN'S MAGAZINE

carefully ransacks these hundreds of publications, and culls the **choicest** and the **best** appearing in each of them. The readers of the Busy Man's get the Cream of Hundreds for the price of one. Every article is **select.** No turning over a dozen pages to get one good one; every page is interesting. All articles not reproduced are classified under suitable headings, so that any reader can see at a glance what the magazines of the month contain in his line. A review of the latest books is given in each issue.

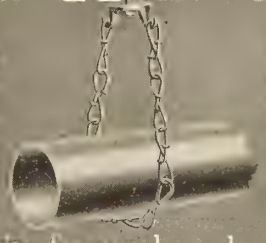
This many-in-one magazine will cost you only $2 per year, if you are a subscriber to Plumber and Steamfitter, $1.50. You cannot afford to do without it.

Have your subscription commence with our Christmas number, which will be off the press in a few days.

Write us to-day.

THE BUSY MAN'S MAGAZINE
TORONTO

NIAGARA CHAIN *for* PIPE HANGING



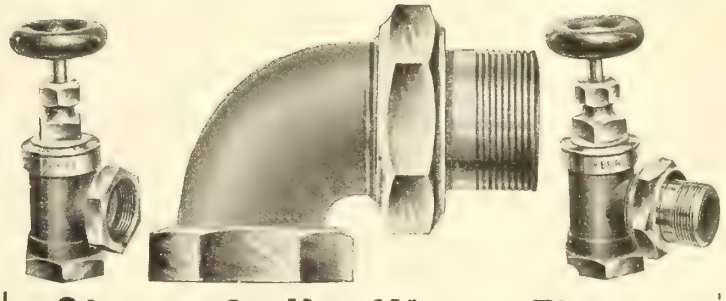
Most convenient and neatest as well as the most economical hanger on the market.

Pipe may be hung any distance from ceiling with this hanger.

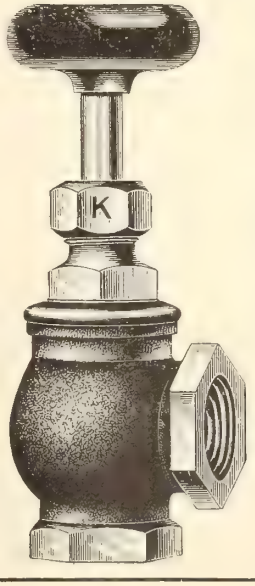
Permits of easy and exact adjustment.

Write for samples and prices.

ONEIDA COMMUNITY, Ltd.
NIAGARA FALLS, ONTARIO.



Steam & Hot Water Fitters



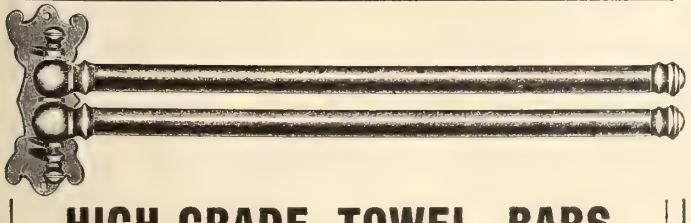
who handle KERR VALVES are the leading men in their line.

You should use Kerr valves for they improve your reputation for high-class work.

Made by a long established and responsible firm.

WRITE FOR CATALOG

THE KERR ENGINE CO.
Valve Manufacturers
LIMITED
WALKERVILLE, ONT.



HIGH-GRADE TOWEL BARS

Soap Dishes, Sponge Baskets, Tumbler Holders, Paper Fixtures, Bath Sprays, Etc., Etc.

Manufactured by

THE CARRIAGE MOUNTINGS CO. LTD.
Niagara Falls, Ont.

Sewage Disposal System of Country Residence

Details of Plant at Millbrook, N.Y., given in the Engineering Review, New York.

The constant menace of the cesspool as one of the principal sources of contamination of the water supply, even though this contamination may not occur immediately, but after quite a period, has been the cause of leading sanitary engineers investigating this most important question of the proper method of the final disposal of sewage from dwellings.

Among the various methods adopted by the sanitary engineer for the final disposal of household wastes, the septic tank is, perhaps, the one most in general use.

In this method of sewage disposal it is customary to discharge the house sewage into a receiving basin, where it is allowed to remain undisturbed, so that sedimentation and fermentation may take place during a period varying in time with the composition of the sewage from twelve to twenty-four hours or even longer, causing the albuminoid bodies which throw off various gases to disintegrate, and allowing the heavy, inorganic bodies to settle to the bottom. The sewage flows from the receiving basin into the discharging basin, where fermentation is carried still further, accompanied by a final slight precipitation. When a certain determined height is reached by the sewage in the discharging basin, the seal of a siphon is broken, allowing the entire contents to discharge through a main distributor with lateral drainage tile branches into trenches located in a disposal field. The sewage in the trenches is attacked by the oxygen held in the interstices of the broken stone, throwing off hydrogen, nitrogen and other gases.

As the drainage lines are laid only 12 inches deep, the nitrogen is absorbed by the roots of the growing vegetation, which accounts for the rank growth of vegetation over the field.

The disposal of sewage by this method is dependent upon the character of the soil of the disposal field, the distance of the field from the house, the number of persons living in the house, and other considerations which can only be decided by an engineer.

The accompanying illustrations show a method of disposing of the sewage of a country residence at Millbrook, N.Y.

Details of the receiving and discharging basins, with the adjoining siphon basin and its siphon, are shown in Fig. 1.

The receiving basin has a capacity of 1,500 gallons per day, which, when the house is in normal use, allows for the daily consumption of 100 gallons of water per person.

The discharging basin has a capacity of about 800 gallons and discharges twice a day.

The basins are constructed of 16-inch field stone laid in portland cement, and are given a half-inch coating of portland cement, brushed smooth inside and trowel-smoothed outside. The basins are provided with heavy iron manhole frames and covers two feet in diameter, and have large, strong, iron steps. The bottoms of the basins are compose of six-inch concrete, laid to drain to one point. All the intersections of the stone are made with full round corners, so that the basins can be readily cleaned. The basins are so arranged that they may be drawn off one into the other.

The siphon used is a three-inch Rhoades Williams, the mouth of which is set in a small sump, built into the

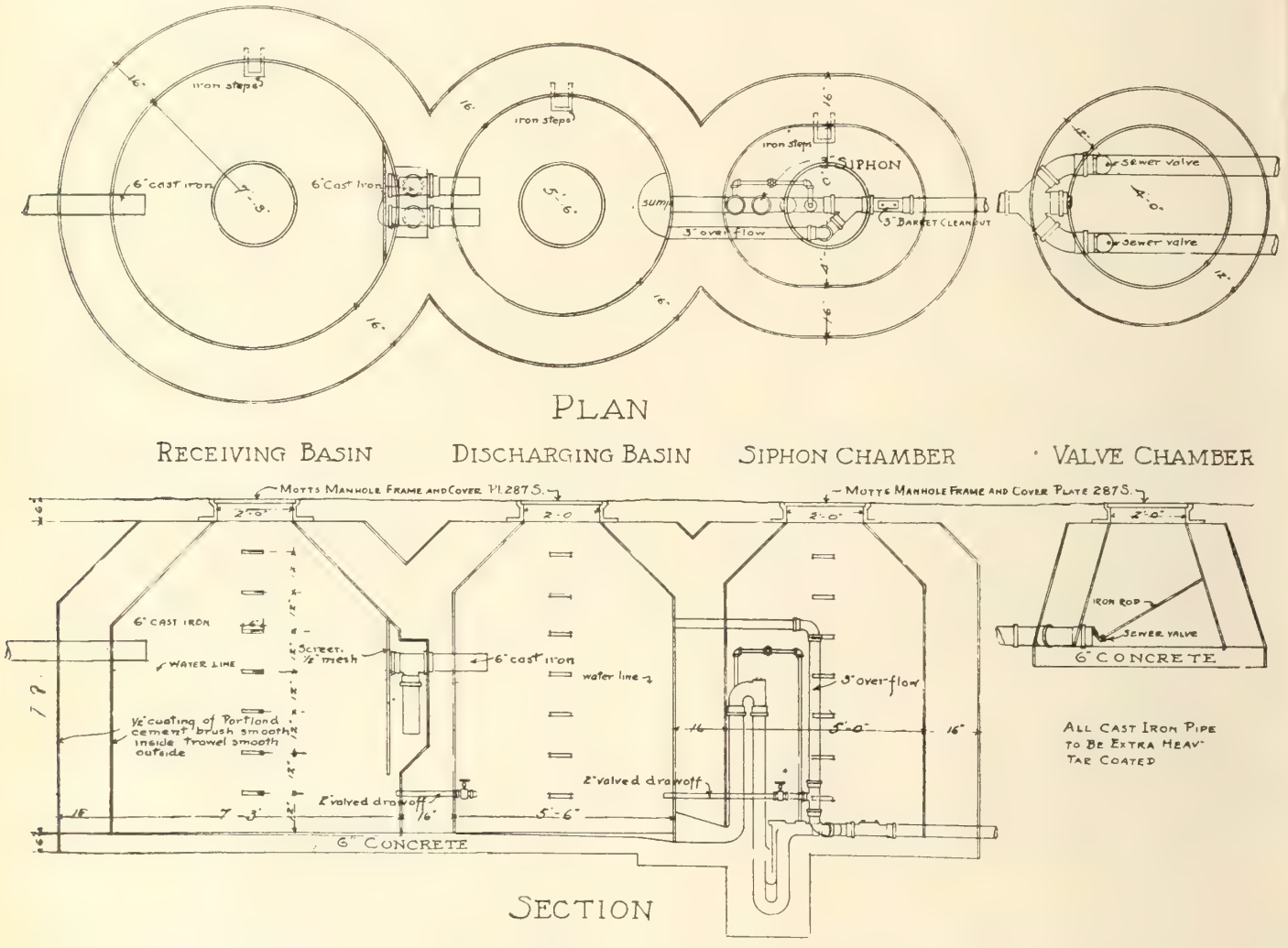


Fig. 1—Details of Receiving and Discharging Basins of Disposal System at Millbrook, N.Y.

bottom of the discharging basin, so that when the siphon operates the entire contents of this basin are carried off. In the siphon basin is also provided a three-inch overflow and a two-inch valve draw-off; also a three-inch Barrett clean-out. All the pipe work in the basins is of "extra heavy" tar-coated cast iron pipe.

By the action of the siphon, the sewage from the discharging basin is led into a four-inch vitrified main discharge pipe, which terminates in the main distributor.

The main distributor, as shown in Fig. 3, consists of a four-inch main with branches.

The disposal field (Fig. 2) is located forty feet from the house, and consists of 2,400 feet of three-inch drain tile, laid about twelve inches below the surface of the ground, as shown in Fig. 4.

tile is the ordinary absorbent drain tile, is not vitrified, has no hub or spigot, and comes in one-foot lengths. It is laid on gutters of the same material, which act as a bed upon which the tile rests, and which allows the tile to be laid with much more care than if it were simply laid upon the ground. The

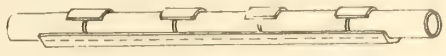
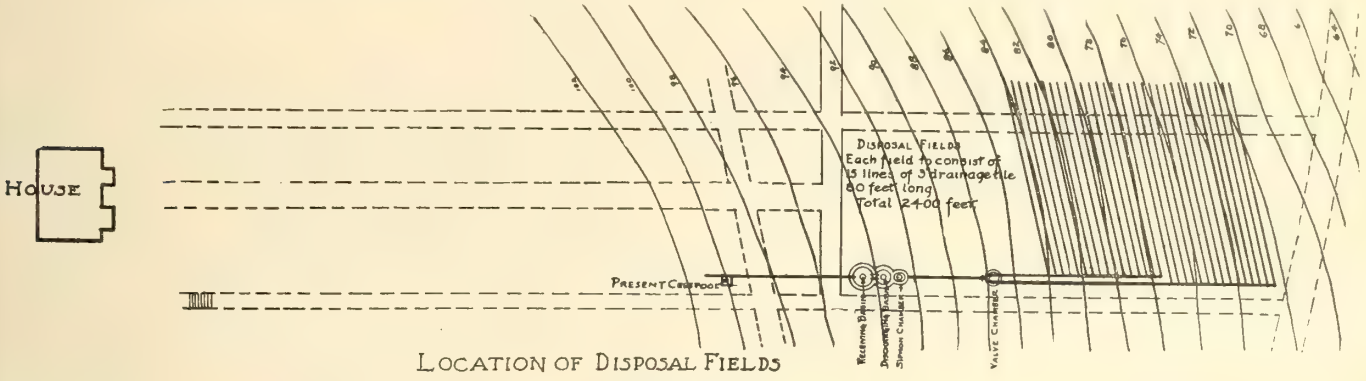


Fig. 6—3-inch Drainage Tile.

gutters also serve to hold the tile in place, when the tile trench is being back filled, and act as a permanent bed, so that the tiles at any future time may be removed for cleaning and relaid in their original position and grade. Over the point where two tiles meet is

The assets of the Canadian Boiler & Radiator Company, Limited, Hastings, Ont., are to be sold on Nov. 30. They consist of about $18,000 worth of real estate and buildings, raw material, moulding shop equipment, machinery and tools, patterns, and finished stock. The concern was established about a year ago by Peterboro men, including several plumbers. A site at Hastings was secured and buildings erected, manufacturing being started a couple of months ago. The present trouble is over the purchase of some raw material, it is understood. While the location is not considered favorable by some, Hastings is convenient to many large towns and cities, where many boilers and radiators are required. The plant is adapted for a general machinery and foundry business as well as for the making of boilers and radiators.



LOCATION OF DISPOSAL FIELDS

Fig. 2.

The tile has a fall of six inches per hundred feet, and is surrounded with about six inches of broken field stone. The tiles are laid about a quarter of an inch apart and the lateral lines do not exceed 90 feet in length.

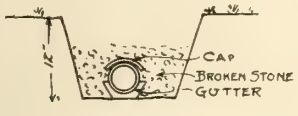


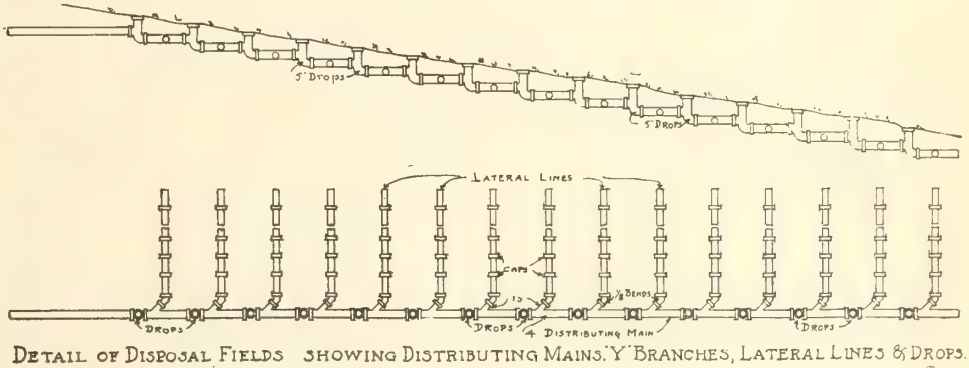
Fig. 3—Tile in Trench.

The manner of disposing of the sewage by means of special "drops" is shown in Fig. 3. By means of these "drops" the sewage flows with but the slightest fall. The drops are of vitrified pipe, made in one piece, and have hub and spigot ends. Between the drops are placed special drainage branches. These are also of vitrified pipe, and are made "right" and "left," as the invert of the three-inch branch is on the same level as the invert of the pipe itself.

Fig. 5—Drainage "Y."

These special drainage Y branches are shown in Fig. 5.

From the end of the three-inch drainage Y branches is laid the three-inch drainage tile, as shown in Fig. 6. This



DETAIL OF DISPOSAL FIELDS SHOWING DISTRIBUTING MAINS, Y BRANCHES, LATERAL LINES & DROPS.

Fig. 4.

placed a cap of the same material. This is to prevent the entrance of earth, stones, etc., into the tile when the tench is refilled.

The above work cost, approximately, $1,086, and was designed by William C. Tucker, C.E., New York.

RADIATOR FIRMS FAIL.

The past week has seen the passing of two radiator concerns, although in either case arrangements may be made for the reorganization of the companies.

The Canada Radiator Company, Limited, Lachine (formerly of Port Hope) has been granted a winding up order, a meeting of the creditors to be held on Nov. 22. For a year or more the company has been conserving its resources, having taken over a stove foundry at Ottawa and established a branch agency at Winnipeg. The plant is in a good location and should be able to develop a profitable business.

NEW RADIATOR.

G. Mennesson, Troyes, 18 Rive Droite du Canal, Aube Department, France, has patented a peculiar radiator which is composed of tubes or elements each formed of a single piece of sheet metal bent down on itself in two parts and welded at its edges, At each end of each tube is formed a circular opening by stamping out to receive a pipe connection. The tubes thus made receive a flat and pointed shape, in cross section, offering several advantages. The element can be applied along walls without giving rise to protuberances, and the triangular form of the element in cross section is favorable to the use of steam and to the draining off of water of condensation.

The Kincardine Board of Education are calling for tenders for the heating and plumbing work of the new central school in that town.

PLUMBER AND STEAMFITTER
OF CANADA

The MacLean Publishing Co.
Limited

JOHN BAYNE MacLEAN - - - President
W. L. EDMONDS - - - - Vice-President
H. T. HUNTER - - - Business Manage
WESTON WRIGLEY - - - Managing Editor

Publishers of Trade Newspapers which circulate in the Provinces of British Columbia Alberta, Saskatchewan, Manitoba, Ontario, Quebec Nova Scotia, New Brunswick, P. E. Island and Newfoundland.

OFFICES

MONTREAL - - - - - 232 McGill Street
Telephone Main 1525
TORONTO - - - - - 10 Front Street East
Telephones Main 2701 and 2702
WINNIPEG - - - 511 Union Bank Building
Telephone 3726
LONDON, ENG. - - - - 88 Fleet Street, E.C.
J. Meredith McKim
Telephone, Central 12960

BRANCHES.

CHICAGO, ILL. - - - - 1001 Teutonic Bldg
J. Roland Kay
PARIS, FRANCE - Agence Havas, 8 Place de la Bourse
MANCHESTER, ENG. - - 92 Market Street
Louis Wolf
ZURICH, SWITZERLAND - - - Orell Fussli & Co.

Subscription, Canada and United States, $1 00
Published Twice Every Month

OFFICERS OF NATIONAL MASTER PLUMBERS' ASSOCIATION.

Past President—F. G. Johnson, Ottawa.
President—John Watson, Montreal.
Vice-President—Joseph Laurier, Montreal.
Secretary—H. A. Knox, Ottawa.
Treasurer—Harry Mahoney, Guelph.

Provincial Vice-Presidents—
Ontario—Charles Taylor, Brantford.
Quebec—J. E. Walsh, Montreal.
Nova Scotia—F. Dexter, Truro.
New Brunswick—H. Dryden, Sussex.
Manitoba—A. J. Hammond, Winnipeg.
Alberta and Saskatchewan — E. J. Young, Calgary.
British Columbia—Bert Weeks, Vancouver.

Chairmen of Committees—
Legislation—H. J. Chandler, Ottawa.
Apprenticeship—J. A. Thibeault, Montreal.
Sanitary—L. Legrow, Toronto.
Essay—G. A. Wootten, Halifax.
Organization—H. McCauley, Montreal.

REASONS FOR RECENT FAILURES.

Although there have been several failures among the master plumbers of Montreal recently, it must not be assumed from this that trade is in a bad condition so far as work is concerned. As a matter of fact the city is going through a great epoch of building prosperity. The architectural character of the streets in the business section is changing with almost mushroom rapidity. Magnificent many-storeyed structures are taking the place of the insignificant buildings, that at one time housed the great corporations of the metropolis, and on every side is heard the clang of the riveting hammer—the ring of the bricklayer's trowel. In the residential districts, too, the same building development is noticed. Houses and flats are springing up all around, and even the rigors of the winter are now being defied in a manner which at one time was thought impossible in the building trade. With all this activity there is bound to be much scope for the plumber. Why then, it will be asked, has the discordant note of failure among the master plumbers been struck so often of late ?

The question is not difficult to answer. In the first place, there always will be men, who, despite fine prospects and every chance of success, fail to take advantage of their opportunities, and by neglect and incapability, wreck their businesses. Such derelicts are to be met in every branch of industry. Allowing, however, for a fair percentage of these incompetents, there is still rather a large failure record to account for in Montreal, and an inquiry into the probable circumstances giving rise to this unsatisfactory situation indicates three salient causes—insufficiency of capital to carry trade, the cheapening of prices below a profitable margin, and the hurtful effect of placing out contracts as a whole. It is apparent to all business men that the first cause is one that can easily be guarded against by the exercise of that amount of caution incumbent upon a business man. It is natural that a young firm should desire to do all the business it can, but in the eagerness to swell the order book—an eagerness that is intensified by the knowledge that work is to be easily secured—the vital fact is often ignored that extended operations mean an increased pay roll, and a heavier bill with the jobber. The plumber has usually a long time to wait for his money—he and the doctor are about on a par in this respect—in most cases much longer than the jobber will or can wait for his, especially in these days of a tightened money market. As a natural sequence, unless the young firm has well gauged the carrying-over power of its capital, bills are not discounted, interest is paid probably higher than the profit on the work itself, and then comes the hard struggle and the fatal beginning of the end.

The two other reactionary features in the plumbing situation in Montreal—the cheapening of prices, and the effect of general contracting are apparently, however, mostly responsible for the situation as it stands at present. The only cause is a corollary of the other. The plumbing trade apparently is distinctly at variance with the plan that has grown up in recent years, of architects letting out contracts as a whole to general contractors. The system may be of advantage to the architect in the way of saving time and worry; it certainly seems to be of advantage to the contractor, but the unfortunate plumber in the process is not only squeezed in price, but is at the mercy of the financial soundness of the firm responsible for the whole erection. A plumbing firm, after it has carried out a big sub-contract, is not in very good shape to meet the drain caused by the contractor failing, but this is what has happened in Montreal as many other places. It is hardly fair that the plumber should be placed in this hazardous position. If it were possible for him to be absolutely certain of the financial position of the contractor, the evil could be avoided by not tendering. But even with the customary business methods at his disposal to satisfy doubts on the point, the best reports often prove to be unreliable, and the plumber loses the fruits of his labors. An element of chance has to be taken. The prominent contractors of strong standing, and general good repute, have not a monopoly—it would not be good for trade if they had—and the firm looking for sub-contracts cannot wait until the big men get contracts, and invite tenders. Certain business risks must be run, unknown men relied upon, and should the latter fail to meet their obligations, which is not unheard of in these days of general contracting when large sums of money are necessary to sustain a big undertaking and banks are chary of financing, then the plumber goes to the wall.

Another general complaint is that some contractors holding power of sub-contracting are in the habit of "peddling" the contracts. By this pernicious method, the standard of the plumbing working price is lowered until the profit is reduced to a minimum. Beyond this the system of handing over accepted sub-tenders to the general contractor leaves a loophole for abuses that injure the plumber, and militate against the owner of the property getting the value and the work to which he is really entitled. The best way to avoid the disability against which the plumbers are now fighting is to return to the old plan of letting out contracts separately, and not as a whole. In this way would the plumber be spared the grinding down of prices on his quotations, and be free from the bugbear that is now constantly attending him, of the contractor failing before he can secure his hard-earned money.

DEADLY WATER HEATER FUMES.

The increasing number of deaths in Chicago lately from the dangerous gases generated from water heaters in small unventilated rooms, has stirred the city authorities into action. An ordinance, it is understood, will shortly be introduced by the city council which will require all water heaters in unventilated rooms to be equipped with a pipe which will convey the gas fumes to the outer air. As a result of these deaths, tests have lately been made by officials of the coroner's office, which prove conclusively that many persons in the past year

have been asphyxiated by the fumes of the gas given out by these heaters.

The investigators used a small bathroom for their experiment. A rabbit and a guinea pig were placed in a cage in the room and the window and door were closed tightly. The experimenters, watching through the transom, saw the animals fall dead within twenty minutes. Then a 3-inch pipe was connected with the gas heater so that it formed a ventilating flue leading to the open air. Again the burner blaze was lighted. Another rabbit and another guinea pig were put into the room. They were kept there, with the heater flame burning, for an hour and a half. When taken out of the room they showed no ill effects from the experiment.

POST-OFFICE MISMANAGEMENT.

"In the matter of the theft of letters from the post office in which one young man was found guilty and sentenced to three years in the Kingston penitentiary we are compelled to call public attention to the small salaries that these clerks receive. It was shown in evidence that this man was married. His hours were long, his responsibilities important and his salary nine dollars per week. We mention this, making no excuse for the criminal, but we are fully persuaded that the conditions are such that in the end the public service will be filled with incompetent and unambitious men and the present intention to save money will, in the long run, end disastrously for the service."

In the above words the grand jury at Toronto in their presentment to Judge Winchester the other day, condemned, as the MacLean newspapers have been doing for a long time, the post office administration inaugurated by Sir William Mulock and some of his personally-appointed and incompetent officials. The Post Office Department of Canada is the largest business organization in the country, bigger than the Canadian Pacific Railway. What would the public think of the directors of the C.P.R. or any big corporation if they selected a village doctor with no previous experience in railroading to be the general manager of the system? Yet Sir William Mulock made as head of the post office system just such a man without regard to the needs of the system, but merely as a reward for political services. or, as some assert, to get a possible opponent out of the way. Business interests in all parts of Canada are suffering. Hon. Mr. Lemieux has done much to improve the situation, but he cannot make the progress the country demands unless he has a competent organization to support him at Ottawa. It should be a clearly understood rule that all appointments in the Post Office Department at Ottawa are to be given as a reward to permanent employes who have shown, by their ability and interest in the service, their capacity to handle it.

They are undermanned and underpaid not only in the Toronto office, but it is the same in the extreme west. A recent issue of the Colonist, Victoria, B. C., says:

"The post office staff is working energetically to cope with the receipt of mail at the local post office, but the staff of sorters is all too inadequate to prevent the accumulation and delay, especially of the second class mails. Efforts are made to give as early a distribution as possible of letters, but newspaper mail is delayed daily. Often newspapers lie for a day on the floor of the post office unsorted. Yesterday much of the newspaper mail received by the steamer Charmer at 7 a.m. was still unsorted at 5 p.m.

"The delay is entirely due to the utter inadequacy of the staff. The situation has existed for some time and attention has been drawn to the poor service as a result. Officials of the post office however have been unable to secure permission for the necessary increase of the staff, and the staff has struggled short-handed to cope with the accumulating piles of newspaper mail. Often the day staff leave the accumulated mails for the night staff and in the morning when the day staff return to work there is still a large pile to which further additions are made as the incoming mails are brought in."

INTERESTING EMPLOYES IN BUSINESS.

How can employes be made to take a special interest in their employers' business? This is not a new problem, but the solution of it, in modern practice is comparatively new and is worthy the attention of every paint manufacturer. Of course, every employe ought to enter into the spirit of his task as earnestly as if he were the owner and not merely a cog in the machine. But human nature is such that the highest degree of loyalty cannot be expected without some sort of a stimulant, but it is a question as to what form of stimulant shall be resorted to.

One great manufacturing enterprise in Chicago is conspicuous because of its profit-sharing system. At Christmas time of each year its employes are given a sum equal to 10 per cent. of their wages for the year. The checks thus disbursed amount in the aggregate to hundreds of thousands of dollars. They keep the entire force on the edge of expectation all the year. From office boy to high official all are looking forward to the holiday when their earnings will be increased by this 10 per cent. donation.

Another stimulant is the "welfare work" that is becoming so popular amongst manufacturers. The Paint, Oil and Drug Review tells of a prominent American paint manufacturer who has gone into this plan on quite an extensive scale, giving to it his personal attention, says that he does it because it pays. He maintains a lunch club and gives parties in a large room in the factory which is set apart for that purpose. He has a branch of the public library at the factory and is responsible for all books lost. Christmas is made a big social event, with a Christmas tree party and presents for every "child of the family." This manufacturer is enthusiastic over the results of his social activity. He says:

"We have brought social life into this old building, and I believe the employes like the place where they work. I even hope that their working place is dear to some of them. I know that in all of the departments, when there is a rush on, and we are behind with our work, we never have to worry. The employes stay right here, and work over hours, although they have never been asked to do so.

"It has never been necessary for them to work long over hours, but I can feel how the wind blows when they keep right on after time is up, and put in fifteen minutes or half an hour. There is not a foreman in any of our departments that cannot go off for a week or two and leave the work to the rest of the men and women. They will do it in his absence, and they will not shirk either."

Amiot, Lecours & Lariviere, and the James Walker Hardware Company, two of the most successful of Montreal's retail hardware stores, have experimented successfully with the profit-sharing plan of encouraging employes, their systems having been referred to in these columns in previous issues.

The approach of another new year gives this subject special interest, and the editor will be glad to hear from other Canadian plumbing firms—manufacturing, wholesale or retail—who have adopted the "profit-sharing," "welfare" or "bonus" system of encouraging employes to render faithful service to their employers.

A grand jury at Winnipeg has recommended the release from prison of a journeyman plumber named Lidster, serving a term for contempt of court for failing to supply the books of the union when ordered to do so. His mother had burned the books.

Heating and Ventilating School Houses

The Third of a series of articles by C. E. Oldacre, Toronto.

The system of piping is quite simple, as shown on the basement plan. The indirect radiators are arranged on a two-pipe system and the direct radiators on a one-pipe system. As shown on the plans the direct and indirect radiators are connected to different sets of mains. The returns are run under the cement floor of the basement.

The mains are of liberal proportions, and some of them, on a cursory view, may seem larger than necessary.

Each set of indirect stacks has practically 1,200 square feet of heating surface, each stack being divided into three parts, or sections, of 130 square feet each. The capacity of indirect radiators for condensing the steam is practically twice that of direct radiators, so that each set of stacks of indirect radiators represents the equal of 2,400 square feet of direct radiating surface. This requires boiler capacity in proportion as well as also capacity in the mains connecting with the stacks.

An Expert Opinion.

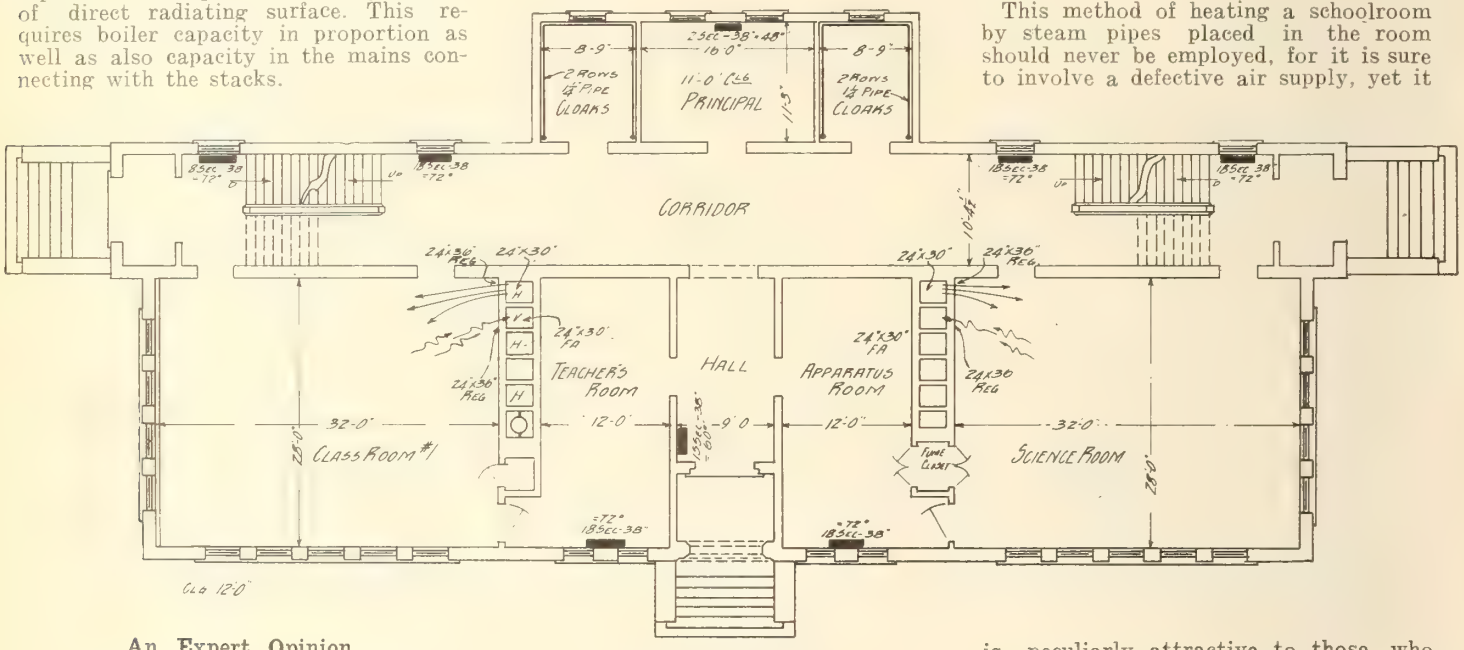
Concerning the size of pipes for indirect radiators, Prof. R. C. Carpenter, in "Heating and Ventilating Buildings," says: "The indirect heating surfaces require about twice as much heat as the same quantity of direct radiating surface and hence, for same resistance in the pipe the area should be twice that required in direct heating. It will usually be sufficiently accurate to use a pipe, the diameter of which is 1.4 times greater than that for direct heating." Quite often pipes of too small a diameter are used in order to reduce the cost—especially so for indirect radiators.

In laying out the piping for indirect radiation, due regard must be had for the greater condensing effect of indirect radiators over direct radiators and also for the heavy demand for steam when the plant is first put in operation in the morning. Smaller piping might be used but at the expense of economy of operation and the noiselessness.

The steam mains are all covered with molded asbestos of one thickness secured by canvas and metal bands. All fittings are likewise insulated.

Effect on Children's Health.

In referring to the value and necessity of proper ventilation in connection with schools, John S. Billings, in his treatise "The Principles of Ventilation and Heating and their Practical Application," says: "They are probably the cause of a vast amount of ill health and premature deaths, although these results are usually not so direct that they can be clearly traced. Every intelligent teacher knows that the dullness and listlessness in some pupils, and the irritability and peevishness in others, which are so manifest toward



Basement Plan for Indirect Heating of School House.

the close of the afternoon session, are closely connected with the gradual accumulation of foul air which has been going on through the day. If after a brisk walk in the open air, you enter one of our city schoolrooms about 3 o'clock, you will find an odor which is far from being agreeable, and which under such circumstances, is the characteristic sign of insufficient ventilation. I have before me the results of an examination of the schools in Boston, New York, Baltimore, Washington, Cincinnati and Rochester, made by competent men, and accompanied in many cases by chemical analyses showing the amount of impurity present in the air. Everywhere the result is the same; with a change of name of place one report would almost answer for all. It is something like the remark of the old toper about whisky. He said there was no bad whisky, although some samples were better than others."

Further, in speaking of the methods to be pursued in obtaining the needed ventilation, he remarks: "When the plans are in course of preparation the average board of school trustees will approve of any number of flues and chimneys, but when it comes to giving out the heating contract, and some enterprising steamfitter offers to guarantee perfect heating by placing coils in the schoolrooms under the windows, for about half the cost of such an apparatus as would do the work properly and furnish fresh air at the same time, the said board will, in nine cases out of ten, try the cheap plan, with the usual results."

This method of heating a schoolroom by steam pipes placed in the room should never be employed, for it is sure to involve a defective air supply, yet it is peculiarly attractive to those who are not qualified to judge of the relative merits of various methods of heating, since it is comparatively cheap and does give the requisite amount of warmth."

School Ventilation.

The necessity for the proper ventilation of schools, churches and all places where a considerable number of persons gather for any length of time has come to be fully recognized and many methods for accomplishing the desired results have been made use of, with more or less satisfaction. To-day it is known that in order to maintain a certain desired degree of purity of the air that will render it fit for breathing, the foul air must be exhausted and the room must be continuously supplied with an equal amount of pure, fresh air from the outside.

That drafts may be prevented in so far as possible, the incoming air must be warmed above the temperature of the air inside the room. In practice the air

is generally admitted at 25 to 30 degrees above the inside temperature usually maintained, or at a temperature of 95 to 100 degrees Fahr. The air should be admitted near the ceiling, as it affords the least resistance and as the warmest air will naturally be found near the ceiling, it can be said the circulation of the air in the room begins there. When admitted near the ceiling, instead of at the floor line, no dust or foul air is carried up to be again circulated throughout the room. Both the inlet for warm air and the outlet for the foul air should be located on the warmer inside walls to produce the best results, to maintain an even purity and an even temperature throughout the entire room.

Temperature Degrees F.			Velocity at Inlet Feet per minute	Net Available area of Inlet Square Feet	Cubic Feet of Air per Minute Supplied at Inlet
Outside	Inside	At Inlet			
25	70	92	377	4	1508

Open Window Ventilation.

It may be said the air for ventilating purposes may be admitted through windows more or less open, which may or may not be provided with deflectors of some kind or other, but this air must be heated if the temperature is maintained and it will cost just as much to heat it after it is admitted to the room as it will to heat it before it is admitted, so that if ventilation to the proper extent is maintained there is no saving effected by such a method. It will be, and is, found to be absolutely impossible to effect the proper ventilation by the opening and closing of windows, to say nothing of the drafts created and the unequal temperatures to be had with such methods.

A system that provides for ventilation and the heating at the same time may cost more in the first place than a simple heating plant, but ventilation is as essential, if not more so, as the heat, and the two can be accomplished together better than they can separately, as pointed out. Any saving effected is at the expense of ventilation.

To maintain the proper degree of purity of the air at least 30 cubic feet of air should be admitted per minute per pupil, to a school room. This means 1,500 cubic feet per minute for a room having a capacity for fifty persons, or ninety thousand cubic feet of air per hour, or a change of air eight or nine times during each hour the school is in session. That it is perfectly feasible to maintain this change of air, J. A. Moir, inspector of public buildings of Massachusetts, in his treatise, "The School House," gives the following table :

Average results of tests made in 500 ventilated schools when outside temperature was below 40 degrees Fahr.

In connection with this he says : These tests show the amount and temperature of air supplied at the warm air inlets, but do not include the additional amount of air brought into the room by leakage through walls, ceilings, floors, or through openings or cracks around doors and windows, when the exhaust through the vent shafts was greater than the supply at the warm air inlets ; neither do they take into consideration the air forced out of the room through the same places when the conditions are reversed and the supply at the inlets exceeded the exhaust at the vent openings.

"In some cases the air exhausted through the vent ducts was considerably in excess of the supply at the inlets, the difference being made up of inward leakage. In other cases it was the reverse, and outward leakage accounted for the difference. These are average tests, and do not include those cases where a great difference was found between the amount of air supplied at the warm-air inlet and that extracted at the vent outlet. Sometimes the amount of air is more than double at the outlet the amount at the inlet, or it may be the reverse.

"The cost of heating school-rooms varies considerably in actual practice, depending upon the construction and location of the building, the system of heating and ventilating installed, and the care and judgment exercised by the janitor.

"A fair average allowance of fuel for good ventilation and proper warming may be considered as ten tons of hard coal per school room per year. This includes all the space within the building occupied by corridors, basement and small rooms, in addition to the school rooms."

RANGE BOILER CONNECTIONS.

Will hot water circulate properly from range to boiler when connected as I have tried to show in the enclosed sketch? I will be glad to have you answer it through your interesting paper.

Yours truly,

Timothy.

Toronto, Nov. 12, 1907.

In Fig. 1 are shown the connections as referred to by our correspondent except as regards the gas water heater. In Fig. 2 is shown a preferable arrangement which under ordinary conditions should work well.

When the connections are made as shown in Fig. 1, the circulating pipe from the range along the kitchen ceiling to the boiler would become airbound, as there is no relief or vent for the air that would accumulate. But in Fig. 2 a T is used at the highest point—the circulating pipe leading into the side out of the bottom and then on to the top of the boiler. This cold water to boiler being connected with a circulating tube inside the boiler (not shown). Off the top of the T is taken the supply pipe carrying the hot water to the various outlets. Through this pipe the air is carried off and prevents the accumulation of air occurring. An objection to such an arrangement is that no sediment cock can be conveniently placed in the circulating pipes—hence they are liable to be clogged in a short time. A better plan, however, would be to set the boiler closer to the range if at all convenient, which can generally be arranged satisfactorily.

The proper connection for the gas water heater is shown in Fig. 2. The side outlet of the range boiler should not be used for the lower connection of the gas water heater as it decreases the storage capacity of the boiler as far as the hot water is concerned, as the water below this connection would remain unheated. The effect is really to decrease the boiler size by an amount equal to the capacity of boiler from the outlet to the bottom of the boiler.

The E. M. Dart Mfg. Company, of Providence, R.I., makers of gas fittings, etc., are establishing a Canadian factory on Niagara Street, Toronto. They will employ 15 men at the start and will build later on. The Canadian Fairbanks Company will handle the output of the factory.

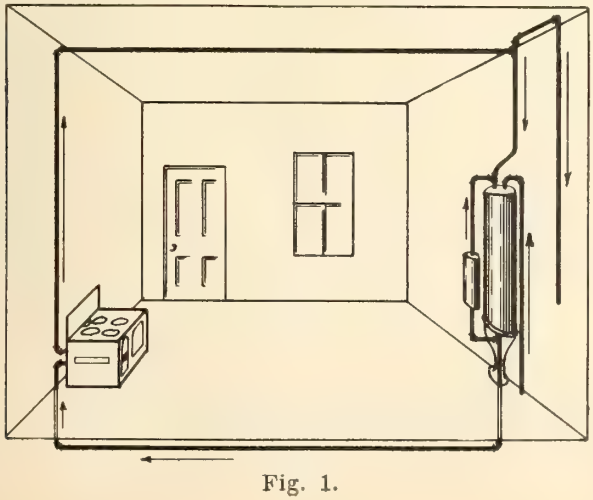


Fig. 1.

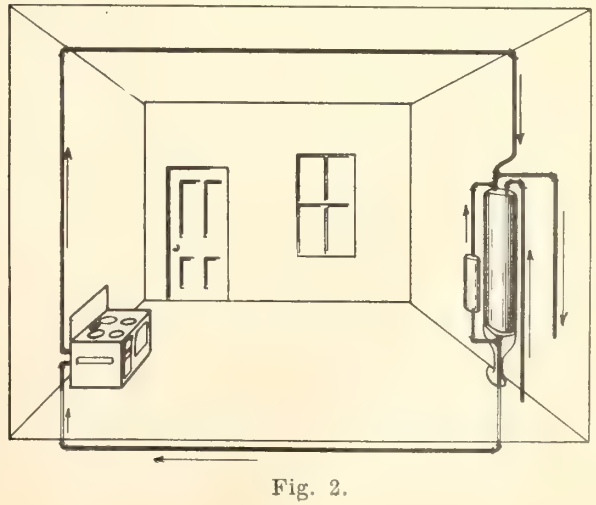


Fig. 2.

Employers' Combination Not Illegal

Interesting Decision in Montreal Court—Master Plasterers Agree to Resist Demands of Journeymen —One Firm Breaks Agreement and is Sued for Payment of $500 Note—Ordered to Pay.

A very interesting decision regarding trade combinations among employers was recently given in Montreal by Justice Saint-Pierre in the case of Lefebvre versus Knott. On June 10, 1905, the Association of Master Plasterers of Montreal were notified by the journeymen plasterers who belonged to "The Journeymen Plasterers' Union," that after the third day of the following month they would no longer consent to work for the then universally accepted price of 33 1-3 cents per hour, but that they would insist upon their wages being advanced to 40 cents per hour for a nine hour day. The master plasterers, many of whom had signed contracts to be executed during the opening season, based upon the scale of wages generally accepted at that time, and for whom a general strike at three weeks' notice would mean serious losses, if not utter ruin, felt that their only alternative was to make use of their rights under the Builders' Exchange as an incorporation, and on June 22 an agreement was accordingly entered into at a special meeting, and signed by all the members present, to the following effect :

Employers' Agreement.

"Whereas, it is essential that the master plasterers in Montreal and vicinity, hereinafter called the subscribers, unite to protect their material interests, now, therefore, these present witnesses, the commercial firms and individual employers whose signatures are hereto attached, have mutually agreed and hereby severally and reciprocally bind and oblige themselves as follows :

"1. In the event of a strike being declared by 'The Plasterers' Union of Montreal,' said union shall not be recognized in any manner whatsoever on and after the 3rd day of July, 1905.

"2. In the event of a strike being declared by said 'union' against any of the subscribers to this agreement, all the subscribers shall immediately lock out all members of the said 'union,' then in their employ, and cease employing same.

"4. Subscribers shall retain the right to negotiate individually with any journeyman plasterer, whether a member of the 'union' or not, and arrange such scale of wages as he may see fit, not to exceed the present rate of 33 1-3 cents.

"6. The subscribers and each of them severally bind themselves to pay into a fund, as liquidated damages, for the violation of any clause in the present agreement, the sum of $500. As an admission of said liability and to secure the prompt payment of said damages, each of the said subscribers shall give a note bearing date not later than the 10th of July, 1905. This note shall be executed in favor of J. Lefebvre, John McLean and Joseph Chamberland, as 'trustees' for the Master Plasterers' Association, and shall be deposited with the secretary of said board.

"7. The provisions of clauses 5 and 6 hereof shall apply to such subscribers only as have union shops.

"8. The subscribers agree that their liability in damages under clause 6 hereof and for the amount therein stated, shall immediately arise in the event of a decision of the subscribers to the effect that the present agreement has been violated. . . .

"10. The clauses of this agreement relating to damages are hereby specially declared to be of the essence of this contract, without which the same would not have been made and binding upon all subscribers for the space of one year from the date thereof."

Firm Broke $500 Bond.

Among the members of the Master Plasterers' Association who signed this agreement were Knott & Gardner, the defendants in the present case. A few days later, in furtherance of the object mentioned in the above agreement, and as a sanction to it, the same gentlemen gave to the three trustees named in the above deed of agreement the five hundred dollar note which under the terms of the coalition, they had bound themselves to sign and hand over to the three trustees. As had been expected, in the month of July the impending strike was finally announced to have begun, and the evidence shows that it was continued for a period covering several months.

About the middle of September, Knott & Gardner broke their engagement and yielded to the strikers' demands by paying their men forty cents an hour. The result of this action on their part proved highly detrimental to the other master plasterers. The strikers, encouraged by their defection, made up their minds to prolong the struggle, and by their doing so increased, in a large proportion, the losses of the other master plasterers, who remained faithful to their pledge. On being informed of the action taken by Knott & Gardner, the association decided that these gentlemen should be made to pay the penalty of $500 agreed upon, and on the 28th of September, 1905, the present action, based upon the promissory notes signed by them, was taken out in the name of the three trustees, and served upon them.

Defendants Resist Payment.

The defendants alleged :

(1) That they never received any consideration for the note in question, and that said note was given under circumstances which rendered the whole transaction illegal, null and void, inasmuch as the coalition or combination formed by the master plasterers was unlawful.

(2) That it is alleged and provided in the agreement, which formed the basis of the present action, that in the event of a strike being declared by the journeymen plasterers' union, of Montreal, all members of said union should immediately be locked out of places of business of the said master plasterers, and that the said subscribers should cease employing any such members.

(3) That it was also provided in said agreement that the parties thereto should have the right to negotiate with journeymen plasterers individually, whether members of such union or not, and arrange a scale of wages for employment, but that said scale of wages should not in any case exceed the sum of 33 1-3 cents per hour.

(4) That the terms of said agreement in general, and more particularly, the clauses above recited, are forbidden and prohibited by law as illegal and immoral, in restraint of the freedom of contracts and of trade generally.

(5) That the present action is brought for the purpose of recovering a penalty alleged to be due by the defendants in virtue of their having, as alleged, paid wages in excess of the amount stipulated, to wit, in excess of 33 1-3 cents per hour, and for no other cause.

(6) That it does not appear from the plaintiff's declaration that the persons seeking to recover the said penalty or any persons or association represented by them have suffered any damage or that they are entitled to invoke any other legal and sufficient cause or action herein arising from failure or default of the defendants in any manner whatsoever.

(7) That by their present action the plaintiffs seek to have the courts enforce and sanction an agreement which is, in effect, an illegal conspiracy to repress and restrain the free exercise of contract and the right to procure such services and pay such wages as a legal freedom of contract would allow.

(8) That the said agreement, and particularly the specific clauses herein referred to, are unjust and oppressive, and constitute an attempt to create a trust or combine prohibited by law.

Law of the Subject.

As will be noticed by the various allegations contained in the pleadings, the main question to be looked into was whether the proceedings resorted to by the master plasterers constituted a combination in restraint of the freedom of trade, and for that reason, would be prohibited by law.

Formerly the fact of forming a combination for the purpose of raising the price of labor was held to be a conspiracy, punishable by law ; but times have changed, notions more humane and more in accord with real justice have prevailed, and now in all civilized countries, the world over, workingmen are permitted to unite together for their mutual protection, and legislation has intervened to sanction such rights.

"A conspiracy in restraint of trade," says section 516 of our Criminal Code (496 of new code), "is an agreement between two or more persons to do or

procure to be done any unlawful act in restraint of trade."

Section 517 (496 of new code) : "The purposes of a trade union are not, by reason merely that they are in restraint of trade unlawful, within the meaning of the next preceding section."

Section 518 : "No prosecution shall be maintainable against any person for conspiracy in refusing to work with or for any employer or workman, or for doing any act, or causing any act to be done, for the purpose of a trade combination, unless such act is an offence punishable by statute."

Then comes section 520, which contains the enumeration of such combinations as are in restraint of trade and as prohibited by law, which said section ends with the following special reservation : "Nothing in this section shall be construed to apply to combinations of workmen or employes for their own reasonable protection as such workmen or employes."

The Judge's Decision.

Justice Saint-Pierre's deductions from the above bearing on the present case were as follows :

"It being shown that the journeymen plasterers were doing nothing but that which they had a right to do in joining together for the purpose of obtaining an increase of wages, the most rigid logic ought, in my opinion, to bring us to the conclusion that if the action of the employes was lawful in making such a demand, that of the employers was equally lawful when it is shown that all they did was simply to club together in order more effectually to oppose it.

"I might add that it is incorrect to state that a general boycott was decided upon by the master plasterers against the journeymen who were members of the union. I find, on the contrary, that under the agreement each individual member of the association was free to employ any one of them at the recognized wages of 33 1-3 cents per hour. I have no hesitation, therefore, in deciding this first question in favor of the master plasterers. The next question struck me at first as being more difficult in its solution than that just disposed of. Could the master plasterers lawfully bind themselves by means of the penal clause which was to be the sanction of their mutual agreement ?

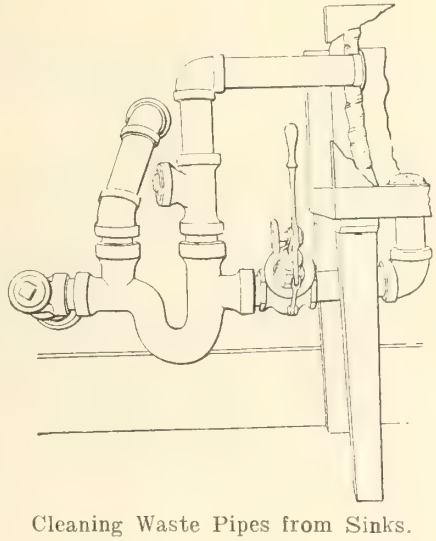
"In France opinions are divided on this point. The difficulty in the way of accepting such penal clauses as a means of binding the contracting parties together has its origin in the very nature of the contract itself. The penal clause being only incidental and subordinate to the coalition or combination must necessarily fail and disappear, if it so happens that, at a given moment, the main contract is itself dissolved. Now it is of the very essence of contracts of this sort that any one who joins it may withdraw from it at any time, and thereby put an end to the main contract so far as he is concerned by the mere expression of his will. What becomes then of the penal clause, which is but an incident of the main contract ? Can it subsist after the main contract, of which it formed part, has ceased to exist ?

Defendants Must Pay Bond.

"I find, however, that the objection pointed out by the French jurists is not in the way of a proper solution of the question as I now have before me. The defendants, as a matter of fact, never withdrew from the coalition. They never notified their co-subscribers that they had changed their mind. They never claimed back their five hundred dollar note. Without giving notice to any one, without a word of warning they simply yielded to the strikers' demand. Under those circumstances it is clear that they thereby rendered themselves liable and that they submitted to the obligation of paying the penalty which was to be the price of their defection. This note of $500 was given to represent liquidated damages. The evidence shows that the damages suffered by the members of the Master Plasterers' Association as a consequence of defendants' defection were far in excess of the amount now claimed from them. The inscription-in-law and the plea to the merits are, therefore, dismissed, and judgment will go for the plaintiffs for the sum of $500, with interest and costs, as prayed for in the declaration."

CLEARING WASTE PIPES FROM SINKS.

The fact that waste pipes from sinks, where cooking utensils and dishes are



Cleaning Waste Pipes from Sinks.

washed, get stopped up by crusts of bread, vegetables, coffee grounds, etc., has caused hotels, clubs and restaurant managers much annoyance, and many plumbers much study. The secret of keeping the waste pipe clear is to have sufficient outflow from the sink to insure full capacity of the waste (2 inches being the proper size) at the same time not to allow the refuse spoken of to leave the sink through the waste, necessitating its removal to the garbage can.

The custom has heretofore been to use a brass waste and stopper. In order to retain water in the sink, the stopper must be put in place and removed when it is to be emptied, thus preventing any protection being placed inside the sink except the regular cross bar below the stopper seat. The cross bar, having large openings, allows the objectionable matter to pass into the waste pipe and cause the trouble. If a filter strainer is placed between the cross bar and the bottom of the stopper, it reduces the outflow to such an extent as to prevent the waste from being thoroughly scoured. In this way the grease soon collects and helps to cause the trouble.

A simple device, as shown in the accompanying illustration, obviates this trouble. It consists of a quick-closing or sliding gate valve, operated by a lever, placed at one end of the sink, the overflow being carried outside of the valve. A convex strainer at least 6 inches broad and 1 inch high is placed over the mouth of the waste at bottom of sink. The strainer is sufficiently perforated with 3-16-inch or 1-4-inch holes, and the lower end all around is fluted, so that sink will thoroughly drain when required. A practical plumber will see the utility of this arrangement without further comment.

This device has been used in hotels and clubs with perfect success by the Rossman & Bracken Co., New York, by whom it was originated.

CARE OF PLUMBERS' IRONS.

Plumbers' irons should always be cleaned before use, and brushed with the felt before putting away, and not allowed to remain in the dirt and ashes under the fireplace; one should also master the use of the iron, as the young plumbers of to-day have a mistaken idea in reference to the use of irons, and it requires a great amount of practice before one is skilled with the plumbers' iron when soldering, says an English authority on this subject. If you should desire to use the lamp or jigger after becoming proficient with the use of the iron, it will not require any practice to do so, but should you be accustomed with using the lamp only, and not having had any experience with the iron, and have some soldering to do where you must use the iron, you will find it rather difficult. In fact, the lamp is a recent introduction into the plumbing craft; plumbing years ago was quite, if not more, intricate than at the present time, such work as the making of service boxes, lead cisterns, soil pipes and D traps were made by plumbers without the use of a lamp. I fail to see why the lamp should be used to the extent it is at the present time, only as a great help to those who find it impossible to use the solder without its use, as with the lamp you can play with the solder for a long time, and often the work is arranged in a careless manner, knowing that with the assistance of the lamp you can get over same. But, as a plumber, one has to arrange his work in a manner that it is easy to execute when circumstances will permit, or otherwise joints should be arranged so that they can be easily made, as very often, when commencing to fix a stack of soil pipe, by using a short length at the bottom the joints can be arranged so that they do not come where branches are required, or just where the tacks are fixed to pipe, and if inside the building we are able to dispense with those awkward and difficult joints that come close up to the ceiling or down close to the floor.

Charlotte St. Methodist Church, Peterborough, will erect an edifice to cost $30,000.

Kew Beach Sewage System at Toronto

W. Hollingsworth, Engineer-in-Charge, i n the Architect and Builder.

That portion of the city iof Toronto known as Kew Beach is situated at the eastern limit on the shore of Lake Ontario and is a residential district. The usual plan is to turn the crude sewage into the lake, but, owing to the conditions differing from those in the other part of the city, it was necessary to adopt the system of sewers and purification works as described. The drainage area of this district is 185 acres, containing a population of approximately 10,000 in the summer months.

Sewer Below Lake Level.

The main sewer is laid along the lake front at a depth varying from 2 feet to 9 feet below the lake level, and is constructed of 16-inch and 10-inch cast iron socket pipes. All sewers from the north discharge into this sewer, and at a point midway between the outfall and the constructed from plans designed by the Cameron Septic Tank Company, and operated by the gear patented by them.

The works are erected on the shore of the lake about 200 feet from the water's edge, and are supported by 10 inch piles driven 16 feet into the hard clay and surrounded by tongued and grooved sheet piling driven 14 feet.

The construction of these works is of concrete in the proportion of seven of broken stone and sand to one of cement.

The three septic tanks are each 100 feet by 14 feet by 7 feet 3 inches deep at the low end, with a total capacity of 183,750 gallons. They are covered with a 3-inch concrete roof, made in the proportions of four and one-half of broken stone and sand to one of cement and reinforced with 3-inch mesh, 10-gauge expanded metal. At 6 feet 6 inches centres are 9 inches by 6 inches concrete beams supporting the roof reinforced with $\frac{3}{4}$-inch Johnson's corrugated steel bars. An inlet channel feeds the three tanks at the high end, each one of which can be operated independently from this channel.

The distribution of sewage into the tanks takes place through $\frac{1}{8}$-inch pipe thence through 4-12 inch openings, three feet above the bottom of the tank, which accomplishes a maximum flow of sewage with a minimum amount of disturbance. At the low end of the tanks 1 3-4 inch outlet pipes are built into the wall, 2 feet 7 inches below the water line, connecting with the cleansing chamber and outlet channel. From here the main effluent carrier is built into the wall of the bacteria beds in line with the outlet channel of the septic tanks and runs the whole length to the end of the beds and has three branches at regular intervals, each feeding one set of four beds.

There are twelve bacteria beds, three sets of four each having a combined area of 1,860 square yards. Each bed is 50 feet by 28 feet by 4 feet 6 inches deep and is filled 4 feet deep with furnace slag varying in size from $\frac{1}{4}$-inch to $1\frac{1}{2}$ inches. On the floor is la d fourteen lines of 3-inch weeping tile collectors, discharging into a 9-inch main collector ; and 6 inches below the surface of the slag are six lines of 6-inch weeping tile distributors fed by a 9-inch main distributor. All discharge pipes terminate in one common chamber from which a 15-inch main filtrate carrier is laid down to the lake, the last 30 feet being supported on piles.

Method of Operation.

The sewage is raised to a height of 22.5 feet at pumping station No. 2 into the inlet channel, which is 12 inches by 12 inches below water line and extending to a point beyond the inlet to septic tank No. 3. From this inlet channel the sewage is admitted into each tank required to be operated through the submerged openings. The solid matter contained in the sewage on entering the tank is broken up, some descending to the bottom, the rest floating to the surface according to the specific gravity.

Septic Farm at Woodbine Avenue, Toronto.

summit is constructed pumping station No. 1, which raises the sewage from the low level sewers from the east and north into the high level sewer which gravitates to No. 2 pumping station, where the sewage is raised into the disposal works. These pumping stations are constructed of concrete and are circular in plan with a partition wall in the centre and have a reservoir space of 3,200 gallons, each containing a duplicate set of pumps and motors, No. 1 consisting of 2-5 h.p. alternating vertical motors and 2-4 inch submerged centrifugal pumps and No. 2 consisting of 2-7 h.p. alternating vertical motors and 2-4 inch submerged centrifugal pumps. Motors and pumps are automatically controlled by the rise and fall of the sewage in the reservoir.

The shafts of the pumps are connected direct on to the armatures of the motors without any bevel gearing, thus practically eliminating all noise while operating.

The disposal works consist of three septic tanks and twelve bacteria beds,

The floating matter undergoing decomposition forms a scum on the top of the sewage on the tank. During winter this scum attains a th ckness of 2 or 3 inches and forms a rough layer of considerable toughness, the surface of which becomes covered with a variety of fungoid growths. During the summer months, however, this reduces to about half the thickness. Light and air being excluded from the tanks the anaerobic bacteria originally present in the sewage increase to an enormous extent and attack all organic substances, the more complex of which are converted into simplex compounds by their action. the ultimate result of the decomposition being the production of ammonia, carbonic acid gas, considerable quantities of hydrogen and methane. These two, being highly inflammable, have in one or two cases been used for illuminating the works.

The mineral detritus, together with the insoluble residue from the sewage solids, accumulate slowly in the tank, and are removed without draining off

the liquid contents of the tank by a line of 6-inch cleaning pipes laid from each tank with four 3-inch openings at the lowest end of the tank, each controlled by a separate valve. These valves are used not more than once every twelve months to prevent any great accumulation of this insoluble matter in the tank.

The effluent, now free from solids in suspension, through the action of the anaerobic bacteria, flows through the submerged outlets and through the effluent chamber, this process arresting any solid matter which may find its way through the outlet pipes in time of excessive flow and thence into the outlet channel.

The Sewage Beds.

The semi-clarified sewage now flows along the main effluent carrier and on to the automatic distributing gear from which it is distributed to each bed in turn through its admission valve. The discharge valve will be closed meanwhile so that the interstices of the filtering material will be filled with effluent. The effluent remains in the contact bed for a period of about two hours, according to the rate of flow, during which the impurities present in solution are oxidized by the bacteria attached to the surface of the filtering medium. The discharge valve will then open, when the filtered effluent escapes, drawing down after it a supply of air into every crevice of the contact bed. The latter will then drain and aereate whilst the remaining contact beds of the set are filling, after which it will again be filled in turn. This method of working renders the contact beds self-cleansing, so that they retain their purifying power unimpaired.

The alternate filling and emptying of the contact beds is effected automatically by means of the alternating gear in the following manner: As soon as bed No. 1 is filled, a small quantity of filtered effluent overflows from its discharge well into a float chamber, lifting the float and at the same time opening the admission valve and closing the discharge valve of bed No. 2. When bed No. 2 is filled this operation is repeated, the flow of tank effluent diverted into bed No. 3 and the discharge valve of bed No. 1 being opened and its contents allowed to discharge.

The bacterial action which takes place in these filters is directly opposite to that which takes place in the septic tank. In this case the aerobic bacterial perform the necessary work, the presence of oxygen being absolutely essential for their life and operation.

This action consists of ehe oxidation of the ammonia formed in the tank. This is converted into nitric acid, which at once combines with the gases present to form nitrates. This completes the process of purification, the resulting effluent being perfectly clear and free from suspended matter.

Edison's Plan for Erecting Concrete Houses.

House Erected in 24 Hours—Bath Tubs Cast in Place—Pipes for Heating and Plumbing Set in Molds—System Only Practicable When Several Houses Are to Be Erected.

The new method of building dwellings of small cost, recently announced by Thomas A. Edison, opens tremendous additional possibilities for the use of concrete. Instead of the old box-like concrete structures with which we are all familiar, it will be possible to have attractive houses at a much lower cost than was possible in the first-mentioned type.

When asked in what particulars his idea was novel, Mr. Edison said:—"There is nothing particularly novel about my plan; it amounts to the same thing as making a very complicated casting in iron, except that the medium is not so fluid. Some one was bound to do it, and I thought that I might as well be the man, that's all."

The method consists in the use of molds, costing $25,000 the set, made of ¾-inch cast iron, planed, nickel-plated, and polished. The different pieces vary in size, some of the interior parts being but two feet square. When in position, the units are held in place by trusses and dowel pins. Into the top of these molds concrete is pumped continuously by compressed air, using two cylinders. The concrete itself acts as a piston, and the two cylinders are alternately filled and emptied. The delivery of the mixture must be continuous, for wherever it is stopped a line appears. To secure this rapid and continuous flow, at the rate of 175 cubic yards per day, a very efficient mixer is required. It has not yet been decided whether a Ransome or a specially designed machine will be used. No rubbing up is necessary, although a few flaws may be present, owing to the difficulty of expelling all air. The escape of air is permitted by the special design of the house, or, when necessary, by a temporary pipe, which may be removed later.

The concrete used is mixed according to the ordinary proportions of one part of cement high in lime, three parts of sand, and five parts of crushed stone. The cement is so finely ground that it readily takes up the requisite quantity of water to make it flow. Another result of the fine grinding, to which the possibility of reproducing minute details is due, is the absolute water-tightness of this material, since there are none of the intergranular openings that are present when coarse ingredients are used. Great strength is assured at the points of stress by wire reinforcements set in the body of the material.

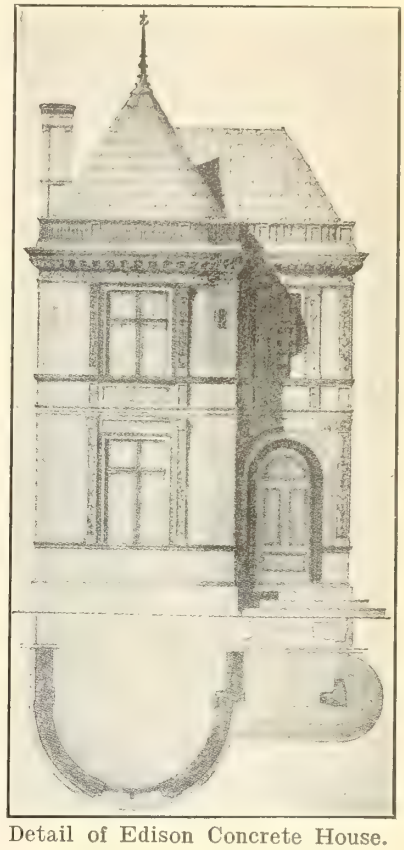
Plumbing Arrangements.

Bath-tubs and similar fixtures will be cast in place. Pipes for the steam heat, conduits for the electric wiring, and the iron tubing through which the lead pipes for the plumbing are to be afterward drawn, are all set in the molds before the cement is run in. The only wood present will be the doors, window sashes and perhaps a few strips to which to attach carpets.

Although any type of architecture can be followed in making the original molds, the first house of this kind to be built will be in the style of Francis I., richly decorated with designs that would be prohibitive because of their cost were they in stone. It will have a cellar and three storeys, with nine rooms. The walls are to be 12, 10 and 6 inches thick in the various parts. The interior will be handsomely ornamented, making no further decoration work necessary after the molds are removed. If it is desired to heighten the inside effect, tinting can be resorted to. In addition to the enrichments, all of these dwellings will have elaborate chimney pieces. The roof imitates tiling and can be painted to suit the owner's taste.

Economical Heating.

Owing to the perfect insulation secured, both to the steam pipes, and to the rooms themselves from the outside cold, but one-quarter the coal ordinarily required is needed to heat these dwellings. By keeping the doors and windows closed, they can be kept correspondingly cool in summer. This manner of building is not economical for putting up sin-



Detail of Edison Concrete House.

gle houses, owing to the cost of the initial outlay, although this outlay is in the nature of a permanent investment, as the plant is practically indestructible. On the other hand, for constructing, say a thousand houses, in proximity to each other, it is very suitable. For instance, suppose that it is desired to lay out an industrial village. After the positions of the various buildings are staked out, a large gang of laborers digs the cellars, and the mold for a house is set up, the operation taking about twelve hours. The running of the concrete requires twelve hours more, and after seven days the molds are removed, and the next house is erected.

According to Mr. Edison, the actual cost of a dwelling made according to this method would be one thousand dollars. The wear and tear on the molds and the interest on the outlay, he figures at about fifty dollars a house. This makes the total cost $1,050 for a house that in the quarter-size model in Mr. Edison's laboratory bears every mark of refinement and comfort.

NEWS OF THE TRADE IN CANADA

A post office will be erected in Kincardine, to cost $17,000.

Chas. Page & Co., Montreal, have been registered as plumbers.

Michael J. Sullivan, plumber, Sarnia, has assigned to Thos. H. Cook.

Mackler & Bendler, plumbers, Montreal, have dissolved partnership.

Brandon, Man., is installing a lighting plant for its pumping station.

A waterworks plant will be installed at Elmira, Ont., to cost $25,000.

The value of buildings erected in Regina, Sask., during 1907 is $1,103,435.

The waterworks and lighting plant for Carman, Man., were completed recently.

B. R. & D. M. Rolph have taken over the business of the Empire Plumbing Co., Winnipeg.

C. A. McKane & Co., plumbers, Haileybury, had their premises slightly damaged by fire recently.

The building total in Winnipeg, Man., for October was $132,450. In October, 1906, the total was $1,091,950.

Mrs. R. J. Cluff, Toronto, has taken out a building permit for a handsome new residence on Beatty Avenue.

A by-law was carried in Chesley, Ont., for $38,000 for waterworks. The supply will come from artesian wells.

Building permits in Victoria, B.C., for October aggregated $81,875. This is an increase of $20,000 over September.

G. Humphries of the plumbing firm of Stevenson & Malcolm Co., Guelph, Ont., won the five mile factory race there Thanksgiving Day.

The Empire Manufacturing Company has announced that it will run all the machinery in its big new works in the east end by a producer gas engine.

George Perrier, Halifax, N.S., has been awarded the contract for the plumbing work in connection with the $30,000 fire station which that city is now erecting.

Brousseau & Son, plumbers, Quebec, have in hand very large contracts for installing hot water heating systems. One of them is the Victoria Hide & Skin Company's building at Limoilon, near Quebec.

The by-law for the new waterworks improvements at Welland has been prepared. For this purpose $15,800 will be required. A report has also been received on a new sewerage system.

Building permits in Edmonton, Alta., for October, total $78,560, a large falling off from previous months. This has been the case in nearly all the larger cities and is an indication of a slight curtailment of building as the result of the financial stringency.

H. G. Vogel Co., Montreal, have the contract for a complete sprinkler system in the new Mark Workman building on St. Catherine St., Montreal, four stories and basement, as well as for a system of water curtains for outside protection.

The plumbing school at the Monument National, Montreal, run by the Council of Arts and Manufacturing, is greatly overcrowded. No fewer than 50 applicants have lately been refused admission. An effort is to be made to increase the size of the class.

Saskatoon's building record this year totals about $1,000,000, in addition to large amounts expended by three railway companies. A feature of the season's work has been the installation of the city's electric light and power service, and the sewerage and waterworks system.

W. Linton, Ontario representative of the Standard Ideal Company, Port Hope, has returned from his annual hunt in Northern Ontario. His party's bag included moose, deer, bear, fox and partridges. Many of "Billy's" friends have been treated to a taste of wild game.

The chartered congregation of the Temple of Solomon, Montreal, have decided to build a synagogue on Ontario St. west, next to the College of Pharmacy. The front of the building will be in Cleveland sandstone and pressed brick. The whole of the inside finish is to be in hardwood. The edifice is estimated to cost $52,000.

The Ontario Government has awarded to Purdy, Mansell & Co., Toronto, the contracts for the heating, plumbing, and ventilating of the new Normal Schools at Hamilton, Stratford, Peterborough, and North Bay. The contracts for the electric wiring in the same buildings go to Fred Armstrong & Company, Toronto. The aggregate amount of all the contracts is in the neighborhood of $63.000.

L. A. Cornelius, of Grand Rapids, president of the Canadian Wolverine Co., was in Chatham last week for the purpose of hurrying up the building operations on the new brass factory. The company are having special furnaces constructed at a cost of $1,000 for heating metal by means of natural gas. This will do away with trouble regarding flues, and will eradicate the smoke cloud that hangs over the average factory. The new furnaces can be used with fuel oil, should the gas supply give out.

Despite the slump in building operations during the past two months, Toronto is still ahead of last year's record for the ten months ending the 31st of October. The following figures issued by the City Architect indicate the number of permits and the value of buildings: Approximate value of buildings, January 1 to October 31, 1906, $11,102,923; 1907, $12,980,635. Approximate value of buildings for month of October, 1906, $1,536,595; 1907, $776,555.

In an interview with Plumber and Steamfitter lately, President Menzies, of the newly-formed Toronto Brass Rolling Mills, with mills at New Toronto, stated that the mills will be re-opened as soon as arrangements are made for a new manager for the works. The plant has been closed down for a couple of years, the old company, the Canada Brass Rolling Mills, having been wound up by foreclosure in August. The new tariff is favorable to the operation of the mills, the duty on brass sheets, rods and tubing having been increased in November, 1906, since which time users of brass have been forced to import and pay the duty, no supply being available from a Canadian mill.

At a meeting of the Board of Works, Sydney, N.S., last week, Ald. McKenzie brought up the matter of defective plumbing in Sydney. He claimed that the plumbing now being installed throughout Sydney was not up to the mark and asked that action be taken immediately to remedy it. Plumbing Inspector Menzies was asked for his opinion on the matter. He said he did not think the lead now being used by the plumbers was up to the standard of former years, but that lead of that standard could not be obtained now. This, so far as he knew, was the only cause for the inferior plumbing. After a general discussion, the Board decided to ask the plumbing inspector, together with the City Engineer, to go thoroughly into the matter, and to report their findings at a future meeting.

NEW STYLE OF WATER PIPE.

Vancouver waterworks officials believe they have found an ideal pipe for use where large mains are necessary.

"When we drew up the specifications for this pipe," said Engineer Burwell, "we purposely left the classification rather vague. We thought that possibly there was some kind of pipe which we were not acquainted with, and wanted to get the very best on the market for the purpose. These specifications were sent to all parts of the world, and the tenders showed that a Glasgow firm had won out on price.

"The pipes are made from soft steel, and lap welded by an electrical process. This makes it possible to tap the main itself instead of putting in special lengths. The welding finish leaves a perfectly smooth surface within, a point of great value, when the capacity of the main is considered. The thickness of the metal is above the specifications, and it is predicted that it will stand a pressure far beyond the demands."

The waterworks officials formerly depended upon riveted pipe for these large mains, but this new type is much superior. In a riveted pipe there is always considerable loss in capacity, through friction, and it is estimated these new pipes will have fully 20 per cent. advantage over the old style in this line. Then these new pipes are bell-jointed, obviating the necessity of bands at each joint, and saving a large amount of lead in completing the main. Each joint of a riveted pipe takes a hundred pounds of white lead, while the new type will only take thirty pounds for each joint.

PLUMBING AND HEATING MARKETS

MONTREAL.

Montreal, Nov. 18.—Business still continues satisfactory, and the various trades are sure, as their order books can show, of full time in factories and shops until, at any rate, the new year. The only discordant note seems to be a feeling of doubt as to what the building trade will be like next year. It is feared in some quarters that the general cry of the stringency of the money market, and the action of the banks in regard to the shipment of wheat, have induced a feeling of hesitancy in the building trade which may adversely affect plumbing and heating conditions next year. But the worst of panics have their end, and when prospective builders look into the state of things, uninfluenced by the prevailing depression across the border, they will see that there is no warrant for any fear as to the immediate future in this country. Despite the bogey that no money is to be had, collections on the whole are very good, and there is no doubt that when confidence in the prosperity of the country is regained in quarters where it should never have been lost, prospects will be as good as the trade is at present—a combination which would leave everybody eminently satisfied.

Brass Goods—Prices are still maintained, and there is no appearance, as yet, of the manufacturers having any intention of starting cutting in the majority of lines. The change in brass values from five to ten per cent, notified last week, has not been altered, and the demand continuing strong, no further alteration is anticipated as yet. Special brass articles are selling well and the trade generally is in good condition and strengthened by the steadying of the copper market. We quote standard compression work 57½ to 60, and fuller work, 70 per cent.

Iron Pipe—The great difficulty in obtaining iron pipe, so noticeable for some time past, is still maintained. Despite full time at the factories, the demand has not yet been caught up. Trade is very good, and but for the delay in executing orders, there would be nothing to grumble about. We quote: 1-in. black pipe, $6.10; 2-in. black, $13.32; 1-in. galvanized, $7.91; 2-in. galvanized, $17.24.

Lead Pipe—The demand is steady and is considered satisfactory. There is still great difficulty in obtaining lead. Prices are firm at 7c per lb. less 5 per cent.

Enamelware—Factories are still running day and night to cope with the demand created by the great building operations during the year. Prices have undergone no change, and the immediate prospects are good.

Radiators and Boilers—Demand continues good and manufacturers have difficulty in keeping pace with the orders. There is a slight feeling of doubt as to how trade will shape next year if building operations become affected by the present money market conditions. Otherwise everything else is satisfactory, even collections.

Metals—Prices have undergone no change, comparatively speaking. Bar lead remains at $5.75; pig iron unchanged at $21.50 for Middlesboro No. 1, and $20.50 for No. 2; Summerlee is unchanged; ingot tin, $36.50 to $37; ingot copper, 17 to 18c; sheet zinc, $7 to $7.25. Heavy scrap red brass is 11½c; light copper, 10c; heavy lead, 3½c; No. 1, wrought iron, $14.50, and No. 2, $6.

TORONTO.

Toronto, Nov. 19.—Trade in plumbing supplies has slackened down to a considerable extent during the past fortnight and jobbers frankly admit that business for November is not as brisk as it was a year ago. Scarcity of money, together with a growing feeling among retailers that prices generally will be lower, is causing buyers to place very conservative estimates on future requirements and to reduce their operations to a hand to mouth basis. While there are few changes in prices to record this week, nevertheless quotations on many lines show a tendency to weaken and this is particularly noticeable in the case of plumbers' brass goods. Although the copper market is not as weak as it was a month ago.

Iron Pipe—The demand for small pipe is as great as ever and though the makers are doing their best to catch up with orders, the scarcity is not relieved in the slightest. The supply of the larger sizes has much improved and deliveries from the mills have sufficiently improved to warrant those jobbers who were quoting some sizes at a premium to re-adopt their normal quotations. Prices are firm as follows: ¼-in. black pipe, $2.90; ½-inch galvanized, $3.75; 1-inch black, $5.60; 1-inch galvanized, $7.25.

Soil Pipe—As most dealers were wise enough to stock up well in this commodity before the recent rise in price, the demand is now very slight. The October price list is still in vogue. Present quotations are: Medium and extra heavy pipe and fittings, up to 6-inch, 70 per cent.; 7 and 8-inch pipe, 40 per cent.; light pipe, 60 per cent.; fittings, 60 per cent.

Lead Pipe—There is little doing in this commodity and the market is practically stationary. Lead pipe is still quoted at 5 per cent. off list.

Solder—A fair demand exists for the middle of November. Wiping solder is quoted at 22c, and half-and-half at 24c per pound.

Cast Iron Fittings—Business is fairly active and supplies are adequate. In sympathy with recent reductions in the American price, local quotations have still quoted at from 50 to 50 and 10 off list.

Radiators and Boilers—Radiators continue in heavy demand and manufacturers are getting all the business they can take care of. Radiator prices are firm and unchanged. A fair demand exists for boilers and supplies are quite adequate for present needs. Boilers are still quoted at from 50 to 55 and 10 off list.

Brass Goods—Lower quotations may be expected at any time. Compression work is quoted at 60, and basin cocks 55 per cent.; fuller work is held at 65 per cent. off list. Ground work quotations run as follows: Bibbs, 45; roundway, 50, and flatway work, 50 and 10 per cent.

CONDENSED OR "WANT" ADVERTISEMENTS.

RATES.

Two cents per word first insertion; one cent per word subsequent insertions.

Five cents additional each insertion where box number is desired.

Contractions count as one word, but five figures (as $1,000) are allowed as one word.

Cash remittances to cover cost **must** accompany all advertisements. **In no case** can this rule be overlooked. Advertisements received without remittance cannot be acknowledged.

RULES FOR COPY.

In addressing replies care of PLUMBER AND STEAMFITTER don't fail to give box number.

Replies addressed to PLUMBER AND STEAMFITTER boxes are re-mailed to advertisers every Monday, Wednesday and Friday.

Requests for classification will be followed where they do not conflict with established classified rules.

Orders should always clearly specify the number of times the advertisement is to run.

All "Want" advertisements are payable in advance.

FOR SALE.

PLUMBER'S Cabinet for sale, cost $75, stands nine feet high and is 6 feet wide, contains 68 drawers, ranging in size from 3 in. x 3 in. to 6 in. x 18 in. Am installing larger cabinet, otherwise would not think of selling. Box 649, Plumber and Steamfitter, Toronto.

BUSINESS CHANCES.

OFFICE space wanted by manufacturer in Toronto: state location and terms. Box 645, Plumber and Steamfitter, Toronto.

SITUATION VACANT.

WANTED—A salesman familiar with plumbing supplies and gas ranges, to represent a Canadian manufacturer direct to the wholesale and retail trade; must have acquaintance with the trade; best of references will be expected; give full information concerning experience, acquaintance with the trade, salary expected; good position for the right person. Only those who can fill the above qualification need apply. Box 639, Plumber and Steamfitter, Toronto.

Assignee's Sale

TENDERS will be received until the 30th day of November, 1907, for the purchase of the following assets of the Canadian Boiler and Radiator Company, Limited, situated at Hastings, in the county of Peterboro, valued as per inventory:

Real Estate and Buildings	**$6,201.50**
Raw Material	**5,021.96**
Moulding Shop Equipment	**1,909.75**
Machinery and Tools	**2,725.78**
Pattern Shop Equipment	**1,345.40**
Stock Finished	**719.00**
	$17,923.39

Immediate possession can be given. The property is well and conveniently situated, with a railway siding running alongside the building. The buildings are new, of white brick, built on a concrete foundation which extends four feet above the ground. There are about three acres of land. The plant and machinery are well adapted for a general machinery and foundry business, and particularly for the manufacture of hot water boilers for heating purposes.

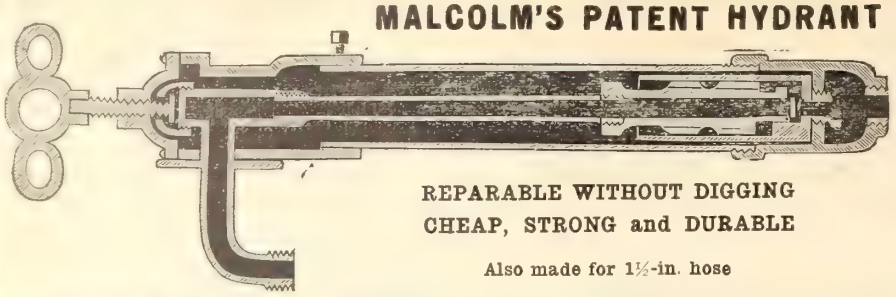
The lowest or any tender not necessarily accepted.

For further particulars apply to the Trusts and Guarantee Company, Limited, James J. Warren, Managing Director, Assignees, 14 King Street West, Toronto.

Enamelware—Sales of enamelware are not as heavy as they should be for November, despite the promising way the month's business opened out. Prices are still quoted from the September list.

Metals—Pig iron has declined over four shillings in the British market, but the drop has not been followed here because domestic prices are already as low as the cost of import.

MALCOLM'S PATENT HYDRANT



REPARABLE WITHOUT DIGGING
CHEAP, STRONG and DURABLE

Also made for 1½-in. hose

MALCOLM & CO., TELEPHONE MAIN 5101 **64 Lombard St., Toronto**

Plumbers !

Will You Increase Your Knowledge ?

J. J. COSGROVE'S BOOK

PRINCIPLES AND PRACTICE OF PLUMBING

will be sent you postpaid on receipt of $3. This is the most complete treatise ever written or published on plumbing and sanitation, giving rules and formulas for doing work on an exact scientific basis instead of by "guessing," and covers the sanitary requirements of all classes and sizes of buildings. It is a RAPID SELLER, because it is a practical book for practical men. ORDER NOW, as the first edition is ALMOST ALL SOLD.

TECHNICAL BOOK DEPARTMENT

MacLEAN PUBLISHING CO., 10 Front St. E., TORONTO

Backed by a Guarantee

All our **Bronze** Powders and **Liquids** have the distinction of being **Guaranteed.** All plumbers and Steamfitters know the necessity of having the **Best** in Bronze Powders and Liquids.

OURS NEVER FAIL

The Canadian Bronze Powder Works, Montreal & Toronto

No order too large **Works at Valleyfield** If your nearest dealer does not handle our goods, write us.

INSTALL THE

ONLY BRASS GOODS

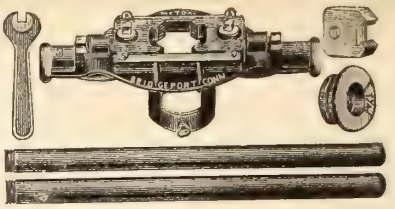
MADE

GUARANTEED 5 YEARS

They make good customers

Glauber Brass Mfg. Co.

CLEVELAND, OHIO, U.S.A.



The Armstrong Manufacturing Co.

317 Knowlton St., - Bridgeport, Conn.

Manufacturers of the Genuine Armstrong Stock and Die, Malleable Iron Hinged Vises, Pipe Cutters, Pipe Wrenches, Bard Adjustable Bushings, Ratchet Attachment for Stock, Pipe Threading and Cutting-off Machine--Hand and Power. Our goods are sold by all Jobbers.

CATALOGUE MAILED ON REQUEST

If you can use High-grade Low Down Compression Basin Cocks with China Index Handles, ask for the Acme Brass Works Nos. 4, 5, 6 and 7 Basin Cocks, which are just what you want. They are the acme of perfection in style, workmanship and durability.

Write us to-day.
Do not delay for to-morrow.

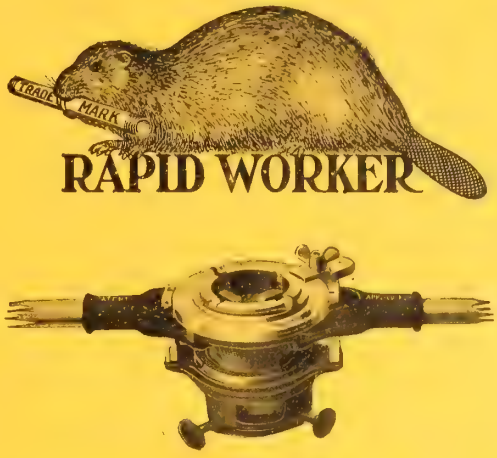
Acme Brass Works

CLEVELAND, O.

Let Our Beaver Do Your Work.

You Don't Have to Change Dies.

Cuts 1, 1¼, 1½ and 2″ perfect threads, all with one set of chasers



RAPID WORKER

The Hand Stock that Starts Easy and Finishes Easier.

"The New Way."

You Will Find it a Sure-enough Beaver.

Write for our special 10-day trial offer

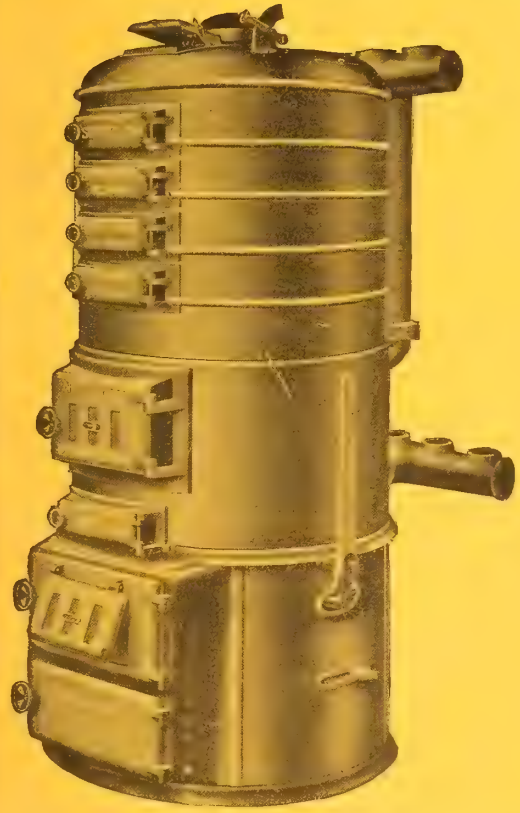
You cannot afford to take the time to thread pipe by hand in any other way

Other sizes of Beavers will soon be born—¼ to ¾—2½ to 4—4½ to 8—8 to 12

Manufactured by

Borden=Canadian Company

166 Adelaide Street West, Toronto



Let Us Give You a Booklet!

Just write and ask us for our little illustrated booklet of household economics, entitled "Simplified Heating." This booklet will tell you how the

"Sovereign" Boiler and Heating System

differs from inferior systems. You will see just why it is easier to sell a "Sovereign Boiler" than any other boiler you ever handled. What with the fuel-saving sifting grate, and the perfect combustion of every piece of fuel put into the fire-box, there are unlimited opportunities for sales in these days of high-priced coal. Why not get in line, and enquire about this money maker?

TAYLOR-FORBES CO., LIMITED

Head Office and Works: GUELPH, ONT.

TORONTO—1088 King St. MONTREAL—122 Craig St. W.

WINNIPEG—The Vulcan Iron Works, Limited

ST. JOHN, N.B.—H. G. Rogers, 53½ Dock St. QUEBEC, QUE.—The Mechanics Supply Co.,
VANCOUVER, B.C.—Boyd, Burns & Company

Architects, Builders and Plumbers

freely endorse

Standard Ideal Porcelain Enameled Ware

Dealers handling Standard Ideal Ware are assured of larger sales, better satisfaction and greater profits. Manufactured in Canada, this ware is the equal of any foreign product of a like nature.

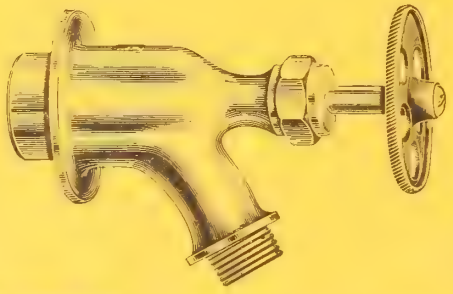
We manufacture Bath Tubs, Sitz Baths, Shower Baths, Sinks, Lavatories, Urinal Ranges, Slop Hoppers, Laundry Tubs, Closet Ranges, Steamship Supplies, Railway Car Supplies, Hospital Appliances, etc.

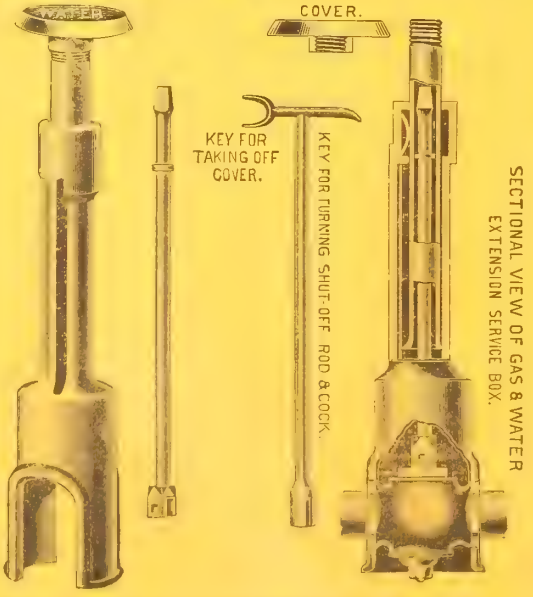
THE STANDARD Ideal COMPANY LTD.

Head Offices and Factories, - PORT HOPE, Ont.

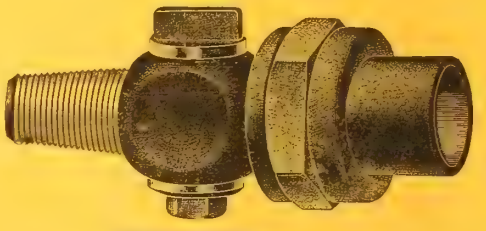
Sales Offices and Sample Rooms: TORONTO, 50 Colborne St. MONTREAL, 128 West Craig St. WINNIPEG, 156 Lombard St.

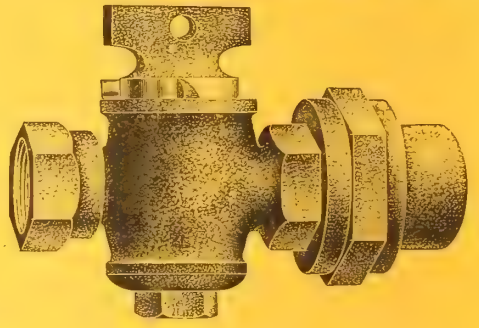
(517)





Fittings That Don't Disappoint





For

Plumbing, Water, Gas and Steam

Hays Manufacturing Co.

Complete Works: - - - ERIE, PA., U.S.A

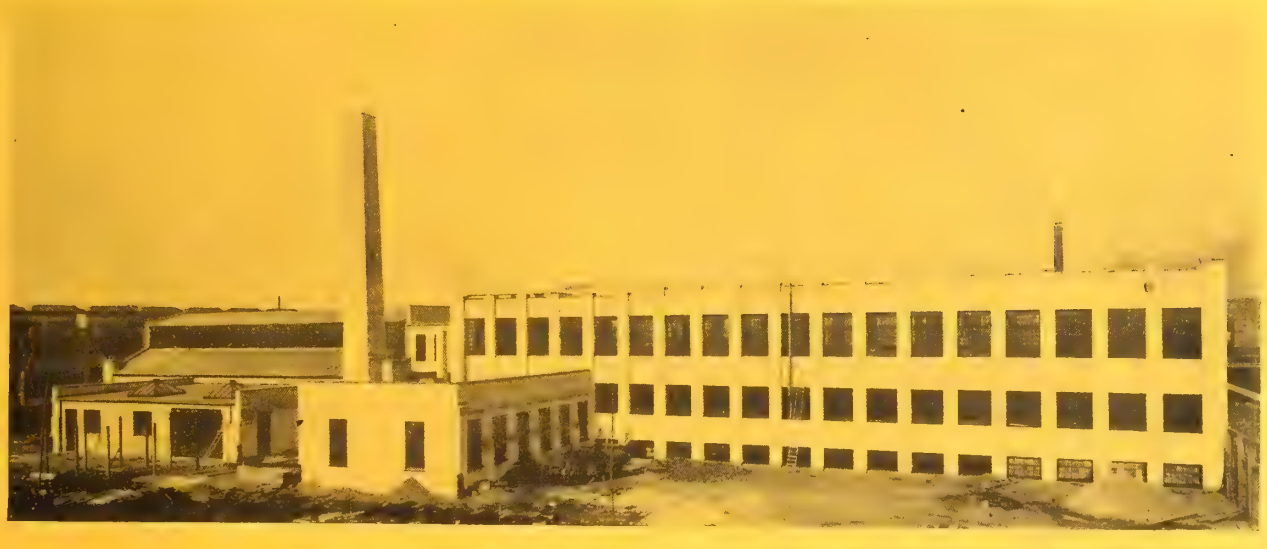
PLUMBER & STEAMFITTER OF CANADA

THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

MONTREAL, 232 McGill St. TORONTO, 10 Front St. E. WINNIPEG, 511 Union Bank Bldg. LONDON, ENG., 88 Fleet St. E.C.

Vol. I. No. 17. (New Series). Publication Office : 10 Front St. East, TORONTO, DEC. 4, 1907. Old Series, Vol. XIX. No. 27

Finest Brass Plant in America



Our increased business, with the demand for a better quality of Brass Goods, has made necessary the establishment of the above plant, which the cut shows in an incomplete state, but which will be ready for operation in about another month.

SOMERVILLE LIMITED

59 Richmond St. East, TORONTO

The James Robertson Company LIMITED

Beg to announce the opening of their

NEW SANITARY EXHIBITION ROOMS

AT

66 Beaver Hall Hill

MONTREAL

We cordially invite you to visit this Exhibition and inspect our extensive range of the finest examples of Modern Sanitary Appliances.

METROPOLITAN CLOSET OUTFIT

BEST COMBINATION IN THE WORLD.

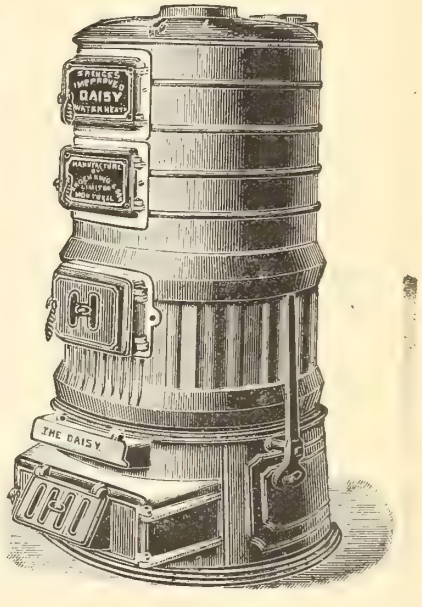
SOMERVILLE LIMITED

59 RICHMOND STREET EAST - TORONTO

Honest Ratings

The ratings of the Daisy Boiler are thoroughly honest and conservative. Every size has been carefully tested and its power accurately estimated, so that in figuring, the steamfitter is positive in gauging boiler capacity according to the published ratings. You will not be obliged to take out a Daisy.

Write for Catalogue.

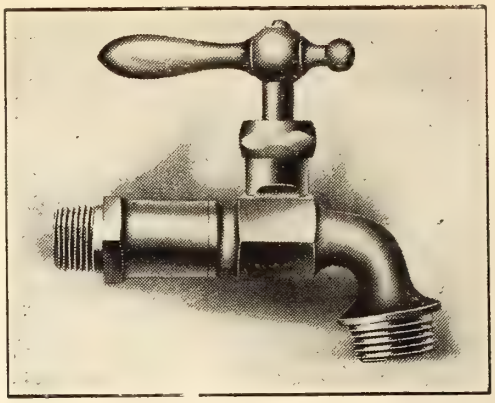


CLUFF BROTHERS

Lombard Street, TORONTO

Selling Agents for **WARDEN KING & SON, Limited**

Plumbers "Attention!" "Stand at Ease!"



Take no more anxious thought as to which make of brass goods to use. Try the **"MONARCH"** — fully tested — designed, studied — material selected—workmanship thorough—finished first-class makes. You'll be pleased—your customers will be pleased and

We'll be pleased to receive your orders

The Monarch Brass Mfg. Co., Limited

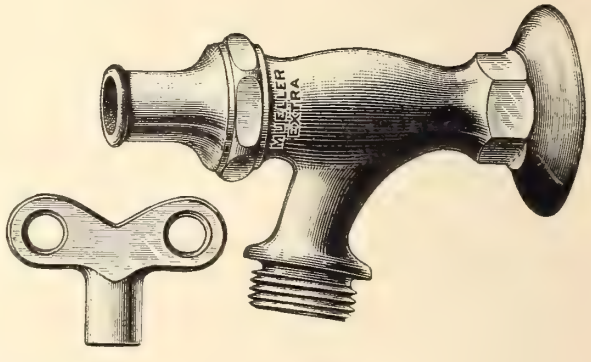
Factory, Port Colborne, Ont.

Office and Warehouse - - - - 278 Dundas St., Toronto

Mueller Extra Compression Sill Cocks

Individualism distinguishes some people from the great mass of humanity. They are conspicuous for some particular reason.

It's their individualism that places Mueller Extra Compression Sill Cocks in a class by themselves. Each size is cast from a pattern designed especially for it. That means each cock has the correct amount of the best red brass in proportion to its size. It is this that gives Mueller Compression Sill Cocks individuality. Unconditionally Guaranteed. Prices upon application.



TRADE MARK MUELLER REGISTERED

H. MUELLER MFG. CO.

Eastern Division
NEW YORK CITY
254 Canal St., Cor. Lafayette.

Works and General Offices
DECATUR, ILL.
West Cerro Gordo St.

BOOKS For PLUMBERS And STEAMFITTERS

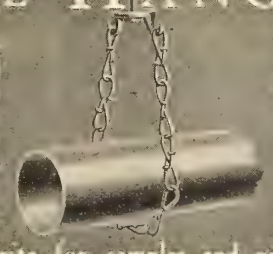
Pertaining to Heating, Lighting, Plumbing and Ventilation. All Orders Payable in Advance.

American Steam & Hot Water Heating Practice	$3 00
American Plumbing Practice	2 50
American Sanitary Plumbing. By J. J. Lawlor	2 00
Baldwin on Heating, or Hints to Steamfitters	2 50
Contract & Estimate Record Book for Plumbers. By B. H. Jessup	1 50
Contract & Estimate Record Book for Plumbers (Pocket edition). By B. H. Jessup	50
Contract & Estimate Record Book for Steam & Hot Water Heating. By B. H. Jessup	1 50
External Plumbing Work. By J. W. Hart	3 00
Fifty Plumbing Charts	25
Formulas & Tables for Heating. By J. H. Kinealy	1 00
Furnace Heating. By W. G. Snow	1 50
Guide to Testing Plumbing. By J. K. Allen	25
Heating & Ventilating Buildings. By R. C. Carpenter	4 00
Hints to Plumbers on Joint Wiping, Pipe Bending & Lead Burning. By J. W. Hart	3 00
House Drainage and Sanitary Plumbing	50
House Heating by Steam & Hot Water. By C. B. Thompson	3 00
Hot Water Heating, Steam & Gas Fitting, Acetylene Gas—How Generated and How Used. By J. J. Lawlor and Geo. T. Hanchett	2 00
Kitchen Boiler Connections	1 00
Lighting by Acetylene Gas, Electric Furnace Generators & Burners. By W. E. Gibbs, M.E.	1 50
Mechanical Drawing for Plumbers	1 50
Modern Plumbing, Illustrated. By R. M. Starbuck	3 00
Modern Sanitary Plumbing, Steam & Hot Water Heating. By J. J. Lawler	5 00
Notes on Heating & Ventilation. By J. R. Allen	2 00
Outline of Ventilation & Warming. By W. J. Baldwin	1 00
Plumbers' Text Book, 300 Questions and Answers. By Frank Tower	1 00
Plumbing Catechism. By C. B. Ball and H. T. Sheriff	1 00
Plumbing & House Drainage Problems	2 00
Practical Gas Fitting	1 00
Practical Hints on Joint Wiping, for Beginners in Plumbing	25
Practical Heating, Illustrated. By A. G. King	5 00
Practical Steam & Hot Water Heating. By A. G. King	5 00
Principles of Heating. By W. G. Snow	2 00
Principles & Practice of Plumbing. By J. J. Cosgrove	3 00
Principles of Hot Water Supply. By J. W. Hart	3 00
Questions & Answers on the Practice & Theory of Sanitary Plumbing. By R. M. Starbuck	1 00
Repair Kinks. By Martin L. Kaiser	50
Sanitary Engineering of Buildings. By W. P. Gerhard	5 00
Sanitary House Drainage; Its Principles & Practices. By T. E. Colman	2 40
Sanitary Plumbing & Drainage. By J. W. Hart	3 00
Sanitation in the Modern Home. By J. K. Allen	2 00
Sizes of Flow & Return Steam Mains	50
Steamfitters' Computation and Price Book. By Dean	3 00
Steam & Gasfitters' Text Book	5 00
Steam Heating for Buildings. By W. J. Baldwin	2 50
Steam Heating & Ventilation. By W. S. Monroe	2 00
Steam & Hot Waterfitters' Text Book. By Thos. E. McNeill	1 00

TECHNICAL BOOK DEPARTMENT

MacLean Publishing Co. 10 Front St. E., Toronto

NIAGARA CHAIN for PIPE HANGING



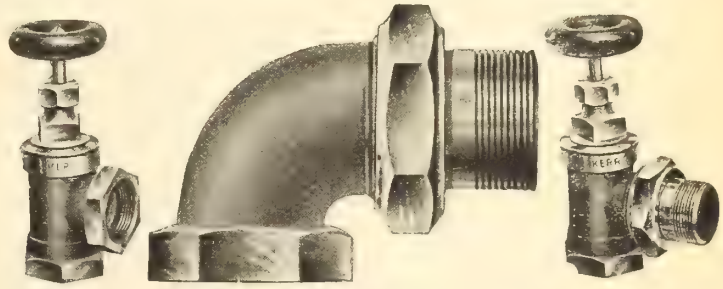
Most convenient and neatest as well as the most economical hanger on the market.

Pipe may be hung any distance from ceiling with this hanger.

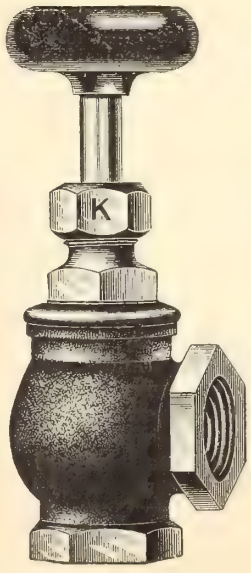
Permits of easy and exact adjustment.

Write for samples and prices.

ONEIDA COMMUNITY, Ltd.
NIAGARA FALLS, ONTARIO.



Steam & Hot Water Fitters



who handle KERR VALVES are the leading men in their line.

You should use Kerr valves for they improve your reputation for high-class work.

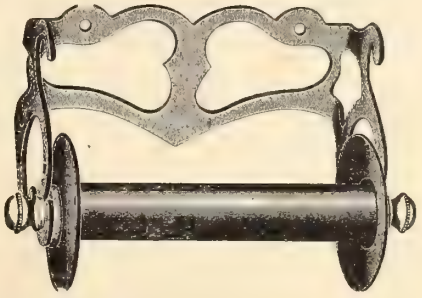
Made by a long established and responsible firm.

WRITE FOR CATALOG

THE KERR ENGINE CO.
Valve Manufacturers
LIMITED
WALKERVILLE, ONT.

TOILET PAPER FIXTURES

and other Best Quality Fixtures.



Manufactured By

THE CARRIAGE MOUNTINGS CO., Limited
Niagara Falls, Canada

Advertising Value of Artificial Light

V. P. McKinnie, in Modern Sanitation, argues in Favor of Utilizing Show Windows both Day and Night.

What story does your show-room or your show window tell to the passerby when night falls? What inducement does it offer, what invitation does it extend to promenaders to stop, look and comment upon the goods displayed? Perhaps in ninety-nine cases in a hundred the answer will be that it offers no inducement whatever.

When this article was suggested, repeated efforts were made on behalf of the editors to secure a number of window photographs taken after dark, but the search proved almost fruitless and only served to prove how sadly neglected after night has been the show window of the plumber.

Your show window is probably your most valuable advertising asset. It is of more importance than your show-room, because it is the first announcement of your business that meets the eye of the prospective customer. Therefore, it is of utmost importance that it be well dressed by day and well illuminated at night, because the customer's first impression of you and your qualifications will be moulded from the progression—or lack of it—reflected in your show window.

A striking example of the advantage of lighting show windows at night. This window advertising will draw business both day and night and results should repay expense several times over.

It is true, that a wave of reform in plumbers' show windows has swept over the country, and that to-day hundreds of windows which only a short time ago were storage places for dirt and a confusion of tools and fittings, are now models of cleverness and cleanliness, reflecting in their neat arrangement of bathroom fixtures not only the business progress and intelligence of the owner but also the improvement in the manufacture of sanitary appliances.

The plumber differs from his business associates in that he has not seen and taken advantage of all the opportunities his show window offers for effective and inexpensive advertising.

Let us suppose you arrange your window with taste and judgment, and through the day when the sun shines, credit is done to your up-to-date methods of exhibiting your goods. But at night when the great commercial value of artificial light and its necessity is made evident on all sides, when the population of your community—your probable customers of to-morrow—throng the streets returning from their work or proceeding to their amusements—at this time what is the appearance of your show window? If it sends forth a shaft of light illuminating your location and the goods you have to sell, then you have already seen the necessity of bright light at night as well as by day to the attainment of business success. But if your window and your store front stand black against the darkness of the night and passersby hurry past your doors with eyes averted because not invited, then the subject of advertising light which we shall talk about here should interest you.

It is at night, when the business day has given place to the gloom of the evening, that a show window can be made a most conspicuous and profitable advertisement. The reasons for this should be obvious. It is in the evening when people go abroad to see and to be seen. The business cares of the day are laid aside, their steps are slow, their eyes observant and their minds receptive.

What arrests the steps and attracts the atention of these evening promenaders? The light that gleams from shop windows. Perhaps it compels only a momentary pause, a passing glance, maybe a critical contemplation of what is offered for sale in the window. At all events, the light has advertised your business and won attention to your window, and how can you tell that the window gazer of to-night will not be your patron of to-morrow?

No matter where your place of business is the light in your window will attract and advertise it. Be it on the most prominent thoroughfare in your city or in some obscure corner in your locality, passing people will see and remember it.

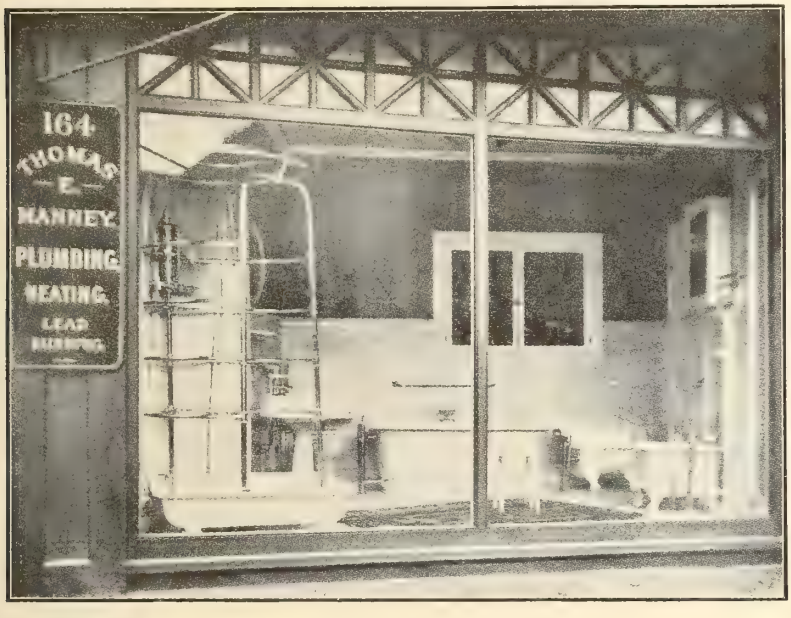
If you have gone to the expense of fitting up an attractive show window with high grade plumbing fixtures, why not obtain full advertising value for your outlay? If you allow it to remain dark after night comes you are cheating yourself, and your show window investment is to a great extent a loss. A hundred years ago, the shopkeepers of England and other European countries barricaded the store front and show windows with heavy oak shutters at the end of the business day. This old-time exhibition of business ignorance has long ago become obsolete, but if you allow your window and store front to be without illumination after dark, then you are following the example of those long ago shopkeepers and putting up the shutters of darkness to hide from view the goods you have to sell.

To illuminate your window and make it eye-catching and bright, it is not necessary for you to spend a large amount of money. No elaborate display or illumination is required, and good results and pleasing effect can be secured by simple means and moderate expense.

If you depend upon natural or artificial gas for light, then you should be able with your own ability to make your window the most attractive in your neighborhood. It is an easy task and only a matter of a few hours' time

for you to run a gas connection to your window. Your judgment and requirements will dictate the number of burners and mantles you will require to provide sufficient light. If your window is fitted up to represent a modern bathroom, excellent light can be secured from wall brackets placed above and on each side of the lavatory, or on opposite sides of the window. A center chandelier of incandescent lights is also a pleasing, inexpensive and very attractive method of window lighting. Photographic proof of the truth of this is presented by the picture of the show windows of the Salina Plumbing Company. The lighting is not elaborate or costly, but so cleverly done that everything is shown to the best advantage. The most pessimistic opponent of advertising can hardly deny that a window of this description cannot help but be a creator of business and a source of profit.

Of course those window lights can-



A plumbing window display, the natural beauty of which is enhanced by brilliant lighting at night.

not be allowed to burn all night and those plumbers who do not reside near their place of business may not fancy the duty of visiting their showroom late at night to turn off the window lights. But this objection is easily overcome. Almost every town or neighborhood has its public or private watchman who patrols the streets after dark, and many merchants whose windows are always lighted make arrangements with these watchmen for turning off or lowering their window lights after a certain hour. The plumber can do the same. The watchman is usually provided with a key to admit him inside but an electric switch or gas shut-off can be attached on the outside of the door in some obscure corner and so make his duty simple and obviate the necessity of his entering the building. If a little light were desired all night a by-pass could be attached.

When the solution of this window problem is so simple, and when it is considered that the plumber himself by reason of his practice can make this great improvement with his own hands, it is indeed surprising that the windows of plumbers the country over are not models of brilliance for others to copy from. But the change from the old to the new is being accomplished. Slowly, it is true, but nevertheless surely, and the day is not far distant when the show window of the plumber will be as bright, pleasing and eye-catching after dark as the window of the jeweler or the druggist.

Determine to take rank at once with the pioneers who have made their windows beacon lights to guide customers to their doors. Dress your window so that it will be attractive by day and brilliant by night. Every penny you spend to accomplish this end is money well spent and is certain to bring you profit. By doing this you exhibit a confidence and pride in your business and the public will repay you by placing confidence in you.

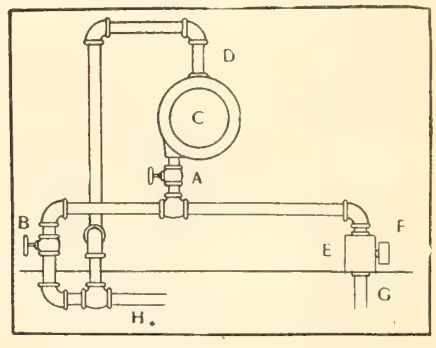
Do not pattern after the plumber of a decade ago who was satisfied to call a dark and dingy shop his place of business. Do not let old fashioned methods and traditions keep you plodding along with those who cannot see the light—and the advertising value of the light. Strike out for new business by using new methods to get it. Follow the example set by successful merchants in other lines of business and make your show window flash an invitation to the passerby; make it brighten and cheer the neighborhood when night falls, and reflect not only light upon the goods you sell but credit also upon your enterprise, progression and sound business sense.

PIPING GASOLINE ENGINE FOR KEROSENE.

Under certain conditions kerosene is as explosive as gasoline and can be used in engines of the explosive type for power if those conditions are applied. We were told that if we could get the cylinder hot by first using gasoline to start we could turn on the kerosene and use it the same as gasoline. We made this change in our engine at the expense of about $10, including a small tank for kerosene, says a correspondent in the Grain Dealers' Journal.

When starting, valve A is opened to pump the cylinder jacket full of water, the water running back into pump to prime it. Closing the valve also holds the water in the cylinder when it is necessary to stop; keeping the hot water in the cylinder does not require so long a run on gasoline to start.

After starting, the engine is run on gasoline until the water in the jacket gets hot, the water from the pump being run to waste pipe. The flow of water through the jacket of the cylinder is regulated by the globe valve B, after turning on the kerosene. By means of the two globe valves, A and B, the amount of water passing through the engine can be regulated almost to a drop. Valves A and B are the 1-in. size



Burns Kerosene Instead of Gasoline

and we use an inch pipe from pump to engine, and 1½-in. for the overflow.

For piping the kerosene (not shown) we use a quarter-inch pipe attached under the gasoline pump, and on the oil overflow we have a three-way connection, ⅜-in.

We have run as much as five hours at a time handling grain, leaving the throttle that furnished the gasoline at the same mark in using the kerosene. We find that kerosene does not require so much air as gasoline, and this is regulated by using a cut-off, which we experimented with until we got the required amount.

The engine should be stopped on gasoline as well as started, so as to leave the pump and pipes full of gasoline ready to start on.

George Vermette, plumber, of Carriere street, Montreal, has made a deed of assignment for the benefit of his creditors. The liabilities amount to about $3,000, while the assets consist of a horse, carriage, book debts, and the balance on a contract. The principal claimants are L. Amiot, Lecours & Lariere, $2,500; Charles Mignault, $225; Joseph Hart, $75, and Joseph Brien, $76.

PLUMBER AND STEAMIFTTER OF CANADA

The MacLean Publishing Co.
Limited

JOHN BAYNE MacLEAN - - - President
W. L. EDMONDS - - - - Vice-President
H. T. HUNTER - - - Business Manager
WESTON WRIGLEY - - - Managing Editor

Publishers of Trade Newspapers which circulate in the Provinces of British Columbia Alberta, Saskatchewan, Manitoba, Ontario Quebec Nova Scotia, New Brunswick, P. E. Island and Newfoundland.

OFFICES:

MONTREAL - - - - - - 232 McGill Street
Telephone Main 1525
TORONTO - - - - - - 10 Front Street East
Telephones Main2701 and 2702
WINNIPEG - - - 511 Union Bank Building
Telephone 3726
LONDON, ENG. - - - - - 88 Fleet Street, E.C.
J. Meredith McKim
Telephone, Central 12960

BRANCHES:

CHICAGO, ILL. - - - - - 1001 Teutonic Bldg
J. Roland Kay
PARIS, FRANCE - Agence Havas, 8 Place de la Bourse
MANCHESTER, ENG. - - - - 92 Market Street
ZURICH, SWITRERLAND - - - - Louis Wolf
Orell Fussli & Co.

Subscription, Canada and United States, $1 00
Published Twice Every Month

OFFICERS OF NATIONAL MASTER PLUMBERS' ASSOCIATION.

Past President—F. G. Johnson, Ottawa.
President—John Watson, Montreal.
Vice-President—Joseph Laurier, Montreal.
Secretary—H. A. Knox, Ottawa.
Treasurer—Harry Mahoney, Guelph.

Provincial Vice-Presidents—
Ontario—Charles Taylor, Brantford.
Quebec—J. E. Walsh, Montreal.
Nova Scotia—F. Dexter, Truro.
New Brunswick—H. Dryden, Sussex.
Manitoba—A. J. Hammond, Winnipeg.
Alberta and Saskatchewan — E. J. Young, Calgary.
British Columbia—Bert Weeks, Vancouver.

Chairmen of Committees—
Legislation—H. J. Chandler, Ottawa.
Apprenticeship—J. A. Thibeault, Montreal.
Sanitary—L. Legrow, Toronto.
Essay—G. A. Wootten, Halifax.
Organization—H. McCauley, Montreal.

DEPARTMENTAL STORE COMPETITION.

Toronto master plumbers have, during the past year, been experiencing a form of competition which seems likely to disturb trade periodically. Departmental stores have stocked plumbing supplies and have applied their well-known methods of cut-throat business to this department of trade.

The latest complaint made by master plumbers is the advertisement of a Toronto departmental a week ago offering 30-gallon galvanized range boilers at $3.99—a dollar and one cent under the jobbers' price and fifty cents less than the manufacturer's price to jobbers at which the departmental is understood to have purchased.

Asked for an explanation of the matter by this paper, the Toronto Hardware Company, which sold the goods to the departmental, stated that as soon as the cut-price had been advertised in the daily papers they had objected to the cutting, but had been told by the departmental officials that the store would do as they pleased. They had bought the goods and would sell them at any price they liked. On being pressed further, however, the Toronto Hardware Company secured a promise that their line would not be cut again, a promise which the company considers satisfactory to them.

But is this satisfactory to the master plumbers in Toronto and throughout Ontario? Has the trade any assurance that some other line will not be purchased in car load lots next week and the price slashed away down below cost? That the departmental is not a philanthropic institution is proven by the fact that the range boilers were first retailed at $6, then more were sold at $5, the jobbers' price, and the balance cleared out at $3.99. The departmental is, of course, not in business for its health and the manager of the plumbing department in making his branch of the store show a profit is not concerned in the injury done to supply men or master plumbers. His job depends upon his ability to earn money for his employer and it is not sensible or practical for plumbers to object to his methods.

The persons who master plumbers must look to for protection against indiscriminate price-cutting are the manufacturers who produce and market the goods. Manufacturers are not compelled to sell to any outside the regular trade channels and they can protect themselves still further by price maintenance conditions in the terms of sale. The law will, of course, prevent any restriction of trade by any branch of the trade conspiring to unduly raise prices.

The plumbing trade requires technical knowledge to a high degree and stores which sell articles required for the sanitary or heating systems of living apartments leaving to irresponsibles the work of installing the fixtures and making the connections cannot be considered as part of the legitimate plumbing and heating trade and should, therefore, be shown no favors and not treated as jobbers by manufacturers because they have the money to buy in quantity.

Here is a question which could be discussed to advantage in these columns by readers of this paper.

CONSUMER PAYS THE TAX.

According to an exchange, a Cincinnati plumber returns a slip with each receipted bill, which serves two purposes. At first glance it appears to be a courteous expression of gratitude for the money. Upon a more careful reading, however, it is seen to be a little campaign of education on the advisability of prompt payment.

"Thank you for the remittance. We trust that we may again have you on our books. A Word About Book Accounts: While we are glad to give people of your standing practically unlimited credit, we cannot in justice to ourselves carry any one over 30 days without adding interest to the charge."

The really admirable and clever fact about this notice is that the cold fact that "the consumer pays the tax," loses all its harshness and appears totally just.

THE EFFICIENCY OF LABOR.

The gravest evil from which America is now suffering, says the Iron Age, graver by far than the exaggerated dangers from monopolies or from freight rebates, is the decline in the efficiency of labor. It finds expression in slouchy work on the part of those who know how to do better, and poor work on the part of those who have never been taught or are capable of learning. To the more serious defect of lowered quality is added the troublesome feature of lessened quantity. It is a curious fact that the one question above all which is uppermost in the minds of manufacturers and other employers of labor, and which is privately discussed by them with helpless iteration, is so rarely touched upon in public utterances. The hope of developing some remedy is the only consolation to the employers of labor when they face the prospect of a decline in the volume of business.

There has been an extraordinary demand for labor of all kinds. So far as that has raised wages and directly increased the cost of production employers have had no grievance, although it is a troublesome and difficult matter to carry them back to the normal level. Manufacturers know that prices for their products usually decline more rapidly than the cost of labor, and must be willing to face that contingency. The laws of supply and demand never operate so promptly in the one case as they do in the other.

As for the quantity of output of labor, that, too, responds fairly well when the demand for labor declines. The process of weeding out the lazy and the inefficient begins promptly, and it may be accepted as a general fact that few managers have not thoroughly ex-

amined their rolls with a view toward making their selections. The percentage usually will be small, but the moral effect is quite out of proportion to the numbers. During the past two years the knowledge that a job was waiting for any man who was willing to take it has had a demoralizing effect upon all labor throughout the country. The fact will be firmly realized soon that steadiness, reasonable industry and acquiescence in necessary measures of discipline are primary conditions for employment, and that simple application for work is not the only qualification.

There is every reason to hope, too, that a lessened demand for labor will be reflected in better quality of work, although in that respect deeper causes have been operative than temporary high pressure of production. The effect of leveling down which has been the curse of the labor unions cannot be so quickly eradicated. It is true that the concentration of industry into larger units tends to deprive an individual workman of the hope of starting on his own account, and the necessity for preliminary scientific and technical training is closing him out of the ranks, once open to him, of managers and superintendents. It is further true that in the days of an extraordinary demand the manufacturer has often permitted, or even encouraged, some sacrifice of quality for the sake of quantity. But, granting that all these factors have been at work, there remains a residuum of wretched work which must be directly charged to the spirit in which labor is facing its tasks. It almost seems as though the hard school of adversity can alone bring back a realization of the fact that the world owes a living only to those who deserve it.

THE VALUE OF SYSTEM.

Every one who has applied rigid system to his business well knows the value of it. He knows that it does away with worry; that it increases the efficiency of his employes by lightening the load on their minds; that it detects and abrogates laxity on the part of employes; that it lessens the possibility of actual loss of money because of irresponsible trustees; that it makes time by losing none, and he also knows that if he should abandon systematic means his own reputation for shrewdness and executive ability would be lowered in the eyes of his customers.

Systematic operation tends to enhance the reputation of the firm adopting it. The buying public like to have time saved for them and system certainly saves time. To save time, to reduce worry to a minimum, to secure complete return from sales, and to save time both for the employes and the buying public, carry on as thoroughly systematic operations as possible.

BETTER HOTEL REGULATION.

The indifferent hotel accommodation provided in all parts of Canada is being well illustrated just now when the country is unprecedentedly crowded with commercial travelers. The matter is making itself evident in several ways. It came out the other day in a petition forwarded to the Provincial Government from the Canadian Travelers' Association, which, referring to municipalities where a local option by-law has been passed, begs that before the act goes into force it shall be the duty of the community to show the Government that ample accommodation for man and beast will be provided. In case the community fails to do so, the petition requests that the by-law shall not be put into effect, but that the Government shall step in and take charge, making such provision as may be necessary for proper accommodation, either by continuing the licenses or in some other way.

The petition seems to be based on the understanding that proper accommodation is furnished in communities where licenses are in operation. The travelers themselves know that very frequently this is not the case. It might well have requested the Government to provide for satisfactory accommodation in all communities.

It is a generally admitted fact that in districts such as are referred to in the petition, hotel accommodation is provided merely as an adjunct to the liquor selling business in a good many cases simply because the Government requires it. In such cases the accommodation is anything but satisfactory, and in a good many Canadian communities sanitary conditions exist in connection with the hotels that the local Boards of Health would not tolerate in a private property. The travelers know this better than anyone else, and they suffer from week to week and from year to year because such conditions are allowed to exist.

When considering the petition from the Travelers' Association, the Government should consider the advisability of providing for satisfactory hotel accommodation in all communities frequented by travelers, whether they are under the control of a local option by-law or not.

COW HAS 'EM GUESSING.

If "Browne's cow" does not die soon she will have half of St. Louis in the asylum. The worst of it is, she is not a real but a theoretical cow—if she was real somebody might go out and kill her.

"Browne" is Professor S. F. Browne, of Washington University. Through a St. Louis newspaper he propounded this problem :

"A cow is tied to the corner of a shed twenty-five feet square by a rope one hundred feet long. Over how much ground will it be possible for her to graze ?"

The result of this apparently innocent proposition is that people who figure and people who do not have been trying to tell Professor Browne all about his cow's grazing possibilities.

"The cow," declares one solver, "in grazing from right to left describes one-quarter of the circumference of four circles, the radii being 100 feet, 75 feet, 50 feet and 25 feet respectively. In going from left to right this is exactly duplicated, and prettily enough the extreme boundary of the cow's grazing is represented by a circle, the diameter of which is 200 feet and area of which is the radius (100), squared, times 3.1416 or 31,416."

Not so, says another, who figures it out this way :

"The cow can graze over three-fourths of a circle whose radius is 100 feet. Three-fourths of the area of such a circle is 23,652 square feet. It can besides graze over one-quarter of a circle whose radius is 75 feet. One-fourth of the area of such a circle is 4,417,875 square feet. The answer is therefore 27,979,875 square feet."

"Still another argues thus :

"To obtain the circumference of a circle multiply the diameter by 3,1416.

"Three-fourths area of a circle 200 feet in diameter equals 23,562 square feet ; one-fourth area of a circle 150 feet in diameter equals 4,417⅞ square feet; one-fourth area of a circle 100 feet in diameter equals 1,963½ square feet ; one-fourth area of a circle 50 feet in diameter equals 490⅞ square feet. The number of square feet over which the cow can graze is 30,234¼ square feet."

Altogether, no two persons seem to agree over Professor Browne's cow, and the class in mathematics at Washington University confesses itself stumped.

FIRST RUN OF METAL.

The King Radiator Co., Toronto, had their first run of metal at their new Toronto plant, on Thursday, November 21. Some machinery is still being installed, but the company expect to be in full swing by next week. The plant is running satisfactorily and a good line of goods is being turned out.

Scientific Treatment of Sewage

Prof. F. Clowes, D.S., in Engineering Supplement of London Times.

It will probably be of interest to the general reader to have placed before him in untechnical language the results of the experience and observation of one who for more than thirty years has been in touch with the problem of dealing with the disposal of sewage.

At the commencement of that term cesspools were still in vogue in many country places although the sewage from the larger masses of the population was carried by water flushes into more or less perfect systems of sewers for discharge into streams or occasionally into the sea. But it was thought possible to abate the nuisance arising from sewage-polluted rivers and foreshores and at the same time to utilize the supposed manurial value of the sewage by causing it to pass direct from the sewer outfall over suitably prepared land, the effluent from the land instead of the raw sewage being ultimately received by the river or sea.

The so-called "land treatment" was introduced and has been retained in many localities to the present time; with a soil of suitable character and sufficient in area it was found possible to send out usually an adequately pure effluent and to produce crops increased in value by the constant irrigation to which they were subjected. But it has been impossible to find for the larger cities areas of land of a suitable nature to purify the sewage at a reasonable cost; and trouble has arisen from various causes, which include the unsuitability of any land in wet and frosty weather and the consequent irregularity of the process of purification.

Substitute for Land Treatment.

Speaking generally, therefore, it was found necessary to substitute for land treatment a process which would concentrate the purification in a smaller area, and which would at the same time render the purification practically invariable in character. This has been rendered possible by the notable discovery that the purification of sewage was not necessarily connected with any special purifying power of the substance of the soil or of the roots of the growing plant, as had been supposed was the case in the sewage farm, it was found that if sewage is passed through beds of gravel-stones at a suitable rate and with admission of air it becomes very effectually purified; further trials showed that solid fragments of an infinitely varied character might take the place of gravel-stones; and it became evident that the natural soil and the growing plant were, therefore not the necessary conditions of securing purification.

And here the remarkable researches of Pasteur afforded an indication of the real source of purification. Pasteur had shown that the production of wine and beer by fermentation, the formation of vinegar, the purification of dead animal matter, and many such changes were really dependent upon the presence of minute living organisms. And it is now known that such special microscopic organisms are the cause of the changes which sewage matter undergoes in cesspools, on the sewage farm, and in its passage through so-called "beds" of stones or fragments. The necessary condition for purification is not contact with the soil or with plant roots, but the presence under suitable conditions of minute vegetable organisms — bacteria and others—which have tasked the highest power of our microscopes for their detection and study. These minute organisms and the spores from which they develop are normally present in raw sewage, and modern methods of sewage treatment consist in placing the organisms under suitable conditions for multiplication and for being brought efficiently in contact with the sewage matters.

Constant Supply of Air.

In order to secure inoffensive purification the changes produced by these organisms must take place with more or less constant supply of air, and the means of securing this has been either (1) to fill large tanks containing the stones or fragments with sewage and allow this to flow away after several hours, subsequently leaving the tank filled only with air for some time before repeating the process or (2) to pass the sewage by trickling from suitable feeds over the mass of fragments and allow the liquid to pass continuously with air through the mass and continuously to flow away from the bottom of the mass. The first method is known as treatment in the "contact bed"; the second is known as "continuous treatment."

Experience has led to the satisfactory treatment of the sewage of large city populations in this country by each of these methods, with the advantage of securing an absolutely certain, unvarying, and adequate purification of the sewage, which can be effected on a small area selected at any convenient point independently of the nature of the soil. The treatment is further effected without giving rise to nuisance of any kind. It has generally been found advantageous to subject sewage to a preliminary treatment by slow passage through tanks —so-called "septic" tanks—before it passes into the "beds." This tends to mingle sewage of different periods and to produce a liquid of average quality for purification in the beds; but it further effects to a very large extent the liquefaction of solid faecal matter which would obstruct the beds. The solid faecal matter of purely domestic sewage may by this treatment become completely liquefied, and liquid matter only may be passed to the beds for further treatment. Even if the liquefaction is incomplete, an odorless scum only requires to be removed at long intervals from the tank and placed upon the land. In town sewage there are usually other solid matters which are not wholly liquefiable by minute organisms, and some "sludge" forms at the bottom of the tanks; this may, however, by proper management of the tank, be removed in an inoffensive condition and spread upon the land. In most town sewage there will also be "grit" from the wear of road surfaces. This is usually allowed to settle separately before the sewage passes into the "septic tanks."

Sewage Beds.

In some sewage installations in smaller towns the place of the septic tanks has been taken by continuous beds of loosely-built slate, or the sewage is passed between vertical slate slabs. A soft deposit forms on the slate surfaces. This deposit can be removed by washing with a hose or separates by gravitation. Clogging of the passages of the beds is thus prevented. A similar deposit forms also in the beds and undoubtedly purification is aided by worms and other organisms visible to the naked eye which are scattered through the soft matter.

Indeed, a deposit which is formed from the dissolved matters in settled sewage was one of the serious troubles when modern methods of purification by so-called "bacterial treatment" were first applied for lengthened periods. A soft brown deposit, in appearance and odor resembling garden soil or "humus," separated upon the small fragments in the "contact" or the "continuous bed" and clogged the bed or reduced its capacity or passages. This has been obviated, more especially in the continuous bed, by selecting fragments of comparatively large size for its construction; the humus matter is then found to be readily washed away by the ordinary flow of the liquid; its presence involves another process of sedimentation in order to clarify the effluent before it passes into an ordinary stream.

Abundant statistics from many centres are now to hand showing by the results of chemical examination the extraordinary degree and regularity of purification which is effected by modern "bacterial" methods. They prove that the purification is such as cannot be obtained by the addition of chemicals or by any other method at present known. There is further evidence of the success of the bacterial treatment in the fact that the effluent when kept at summer heat, either naturally or in an incubator, does not undergo offensive change and can accordingly never cause a nuisance either by itself or when it has flowed into a

water-course. This satisfactory result is at present peculiar to the bacterial treatment.

Good Educational Work.

It may be stated that the London county council has been honorably connected with the initiation and progress of bacterial treatment at least in an experimental form and in its earlier stages. At their sewage outfall at Barking there is still in operation the oldest bacterial bed in existence; it is constructed of coke and is one acre in surface and about six feet in depth; the purification which it is effecting at present on the sedimented sewage is of an entirely satisfactory character. The reports made to the council by their scientific adviser have been constantly published, and many of the more recent ones have been sumarized in book form under the title of "Experimental Bacterial Treatment of London Sewage." by Clowes and Houston (P. S. King & Co.) The results obtained by the experimental work of the council have been abundantly confirmed and extended in various directions by the experimental work and more recently by the large scale treatment undertaken by other municipalities; and those who have considered the results obtained cannot fail to be satisfied that the regulated and controlled purification of sewage by bacterial methods is at present a practical success.

It will be inferred from what has been stated that the bacterial method is the natural method of treating sewage. Use is made of the organisms which the sewage itself contains to effect its purification, and all that is aimed at by plants erected for the purpose is to place these organisms under the most satisfactory conditions in the most economical and practical way possible. The plant required may conceivably be further simplified or improved, but it is significant that many of our largest cities are now settling down to methods of construction which they consider to be permanent, and the study of these plants reveals very considerable ingenuity and resource on the part of those responsible for their construction. It is gratifying to our national pride to know that, as pioneers in the scientific and constructive branches of these most important developments in the treatment of sewage, Englishmen have taken an important, if not a preponderating share.

TIME EXTENDED FOR TENDERS.

The time for receiving tenders for the purchase of the assets of the Canadian Boiler and Radiator Co., Hastings, has been extended until December 14. Tenders for the whole or for part of the assets will be considered by the Trusts and Guarantee Co., Toronto.

The boiler in a closed tank heating system in the Grand Trunk Railway station at St. Catharines exploded on Nov. 25, wrecking a part of the building, but injuring no one.

Coal Consumption in House Heating

O. E. Oldacre, Toronto, in the Metal Worker.

The coal required for house heating is a subject that is of interest to every heating contractor and user of heating apparatus. It is a question nearly every prospective customer will ask of a contractor. In discussing this question, however, I have nearly always found that the user of heating apparatus is satisfied with the amount of coal he has had to burn if he has had good results from the standpoint of comfort, so long as the consumption of the fuel has not been abnormally excessive. The widely varying differences in usage of a house and the differences in construction have a great influence on the amount of fuel that will be consumed in any given size apparatus. The kind of attention given heating apparatus will also cause a wide difference in the amount of fuel consumed during any given period.

The manner of checking the fire will also influence the amount of coal burned during any given period under the same conditions of exposure and weather conditions. The writer has used 90 lb. of hard coal per day in one case and 140 lb. in another, in the same furnace under practically the same weather conditions in the same building and got equally satisfactory results. Each test covered a period of one week, the thermometer readings were taken hourly of the inside and outside prevailing temperatures, with the result that the inside temperature was steadier during the period when the 90 lb. of coal was consumed each 24 hr. than when the 140 lb. was consumed during the same period. The attention in both cases as regards firing and checking was equally as good. The difference was in the method of checking the fire. In the first case it represented a consumption of 2.08 lb. per hour per square foot of grate surface, and in the second case it represented a consumption of 3.21 lb. per hour per square foot of grate surface, or in other words, 55 per cent. more coal was used in the second than in the first case.

Average Fuel Consumption.

If the heating engineer or contractor had thoroughly acquainted himself with all the surrounding conditions; if he could become fully acquainted with the individual requirements of his client or prospective customer and the kind of attention and management that would be given the heating apparatus, then he could feel perfectly capable of giving a statement of fuel consumption that would be required in any specified case, but not until then with any great degree of certainty. One of the best guides to what should be the average fuel consumption in hot water and steam plants under normal conditions, where the plants are properly installed and properly proportioned, is given in W. G. Snow's "Principle of Heating," in which he states:

"Take, for example, a boiler of medium size in which the coal is to be burned no faster than a 5-pound rate in zero weather. Assume the heating season to last 200 days, or 4,800 hr. With an average outside temperature of, say, 45 degrees, the average rate of combustion, based on the difference between the indoor and outdoor temperatures, will be only $25 \div 70 \times 5 =$ 1.79 lb. Making allowance for the lower temperature maintained at night brings the average rate down to about 1.68 lb. This, with a boiler having 4 sq. ft. of grate surface, gives $4 \times 1.68 \times 4800 = 32{,}256$ lb., or about 16 tons for the season.

"If the estimate be based on the radiating surface instead of on the grate area we may assume, for example, a house heated by 1,000 sq, ft. of direct radiation, including mains as a part of the surface. Using the figures previously stated—viz., 150 heat units per square foot of direct hot water radiating surface—and 8,000 heat units utilized per pound of coal, we have $1000 \times 150 \div 8000 = 18.8$ lb. per hour in coldest weather. The average hourly consumption, with an outside temperature of 45 degrees, would be $25 \div 70 \times 18.8$, and the total for the season of 4,800 hr. $25 \div 70 \times 18.8 \times 4800 =$ approximately 32,200 lb. This would be reduced, owing to the lower temperature kept up at night, to, say, 15 tons.

"With indirect radiation, reduce to approximate equivalent direct radiation by multiplying by not less than 1.6. Some boiler manufacturers recommend multiplying by 1.75. Expressed in another way the computation just made, based on hot water radiation, gives about 40 lb. of coal per season per square foot of surface in radiators, allowing 25 per cent. for mains. With steam radiation the coal required would be $250 \div 150 \times 40$, about 70 lb."

Fuel Consumed by Furnaces.

In the Metal Worker of June 27, 1903, and of July 11, 1903, the writer gave data and tables for various sized furnaces and the amount of fuel consumed by furnaces. Table III is as follows:

Grate diameter in inches	Grate area in sq. feet	Equivalent glass surface	Total exposure in sq. ft.	Combined area of flues in sq. inches not to exceed
18	1.77	450	1,160	315
21	2.40	670	1.660	430
24	3.14	798	2,050	560
26	3.69	935	2,400	650
28	4.27	1,085	2,800	765
30	4.91	1,250	3,200	875
32	5.58	1,415	3,650	1,000

Capacity of furnaces adapted to maintain 70 degrees F. with an outside temperature of 0 degree F.—Rate of combustion, 5 lb. per hour per square foot of grate surface.—Efficiency, 60% = 7800 heat units per pound anthracite coal burned.—Temperature heated air 140 degrees F.

In computing the table it has been considered that the building is to be

heated continuously during the period requiring artificial heat. If heated only during the day add 15 to 20 per cent. to the size of the grate area required; if heated intermittently add 40 to 50 per cent. As noted, the above is based on the maintenance of 70 degrees F. inside, with zero outside. The average heating season in our Northern climates will cover a period of seven months, or, approximately, 200 days, and the average temperature for such period is about 45 degrees. Then the average rate of combustion for such a period would be twenty-five-seventieths or five-fourteenths what it would be for zero weather, or 5-14 × 5 = 1.8 lb. per square foot of grate surface per hour. Take, for example, a furnace having a 24-in. grate. Under conditions stated in table III we would have an average hourly combustion of 3.14 × 1.8 =5.652 lb.; for 24 hr., 24 × 5.652 = 135.65 lb., and for the 200 days, 200 × 135.65 = 27 130 lb., or roughly, 14 tons. In a similar way the coal consumption for the various sized furnaces under normal conditions may be ascertained, and is given in table IV:

Annual Fuel Consumption.

Average rate of combustian, 1.8 lb. anthracite coal per square foot of grate surface per hour.—Duration heating period, 200 days.—Average outside temperature for the 200 days, 45 degrees F.

Grate diameter Inches	Col. I.	Col. II.	Col. III.	Col. IV.	Amount coal Tons
18	450	1,160	7,000	11,000	7
21	670	1,660	9,000	17,000	11½
24	798	2,050	13,000	22,000	14
26	935	2,400	17,500	26,000	16
28	1,085	2,800	24,000	30,000	18
30	1,250	3,200	30,000	35,000	21
32	1,415	3,650	38,000	40,000	24

Col. I. gives the amount of equivalent glass surface in square feet to which each furnace is adapted.

Col. II. gives the total exposed wall surface in each case in square feet.

Col. III. gives the greatest amount of cubic contents in cubic feet surroundable, with the exposed wall surface stated, and is variable according to the shape of the building.

Col. IV. gives the maximum contents in cubic feet for which any given size of furnace is commercially advisable in houses that are exposed on all sides under normal conditions of operation.

The relative coal consumption of furnaces using anthracite coal during a season of 200 days may be summarized as follows:

150 to 225 lb. anthracite coal per cubic foot space for season of 200 days.

13½ lb. anthracite coal per square foot exposed wall surface for season of 200 days.

33½ lb. anthracite coal per square foot equivalent glass surface for season of 200 days.

1½ tons anthracite coal per square foot grate surface for season of 200 days.

43.2 lb. anthracite coal per square foot grate surface per day.

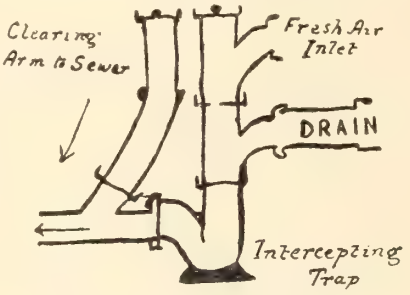
1.8 lb. anthracite coal per square foot grate surface per hour.

With soft coal, 25 to 35 per cent more fuel will be required than where anthracite is used. Small heaters will as a rule burn more fuel per season than the larger ones from various reasons, principal among which is the fact that, naturally, a small house has a larger amount of exposed wall surface ia proportion to the cubic contents than a large one, hence a greater cooling effect on the contained air. On the other hand, it is more probable that small heaters receive better attention than the large ones, as usually they are under the direct care of the user, who may have more or less regard for economy.

Use and Abuse of Intercepting Traps

An Argument Favoring Their Use by J. S. Clements, Sanitary Inspector, Lambeth, England, in the Plumber and Journal of Heating—Read Before the Sanitary Inspectors' Association Oct. 5, 1907.

It may be desirable to go to the root of the matter and consider the primary hygienic and physical principles which underlie modern methods of sanitation as applied to the removal of faecal and other matter by a water-borne system. The aim of modern drainage is simply to secure the dwelling from foul gases proceeding from decomposition or of polluted waters as rapidly as possible, and upon the degree of success which in practice attends this aim must the means currently adopted be judged; for whatever view be taken as to the modus operandi by which the agencies of decomposition or pollution produce disease, it will be admitted that the entrance to the house of gases produced from them



Sketch of Intercepting Trap.

is in any case calculated to impair health.

Based upon the assumption that it is safer to have such a condition of things whereby we can keep the existence of a danger zone on one side of a trap—i.e., on the sewer side—we can proceed with the question which has been intimately connected with the ventilation of sewers and drains for the last 30 years, commencing after the illness of the King, when Prince of Wales in 1872.

The intercepting trap was patented by W. P. Bucahn, of Glasgow, in 1875, and, without any special investigation, was adopted by the Local Government Board, and introduced into their Model By-Laws in 1877. Ever since, this official recognition has caused it to be taken for granted by large numbers of people, and has deterred many from investigating the matter for themselves. The controversy referred to, about 30 years ago, resulted in a general consensus of opinion that "sewer gas must be cut off from the house."

In its original form a 6-in. intercepting tank contained 3 gals. of stagnant sewage. It took the place of, and was the same length as an ordinary drain pipe, with from 2 in. to 3 in. difference of level between the inlet and the outlet.

Its form has since been modified by various makers in a vain attempt to perfect it, chiefly by contracting the body to increase the scour. It is inserted at the lower end of the underground portion of the house drain, forming an obstruction therein nearly 8 in. deep to the flow of the sewage, paralyzing the flow of the whole of the underground portion of the house drain, being subject to stoppage, and undoubtedly an obstruction to every drain.

The trap necessitates the use of at least 50 per cent. more water in flushing cisterns to w.c.'s, and even a three-gallon flush is not sufficient to prevent stoppage.

Early Experiments.

A Committee of the Sanitary Institute in 1893 carried out a series of experiments, and proved that even with a three-gallon flush through a properly constructed straight drain, 50 ft. long, 6 in. in diameter, laid with a fall of one in forty, on trestles above ground, as the result of 600 discharges, 27 per cent. of the solids were left in the intercepting trap after each discharge, and with a 2-gal. flush 35 per cent. The Committee recommended 3 gals. as a minimum.

More recently, experiments by Dr. Porter, on an actual 6 in. drain in connection with a factory, proved that the intercepting trap could only be cleared out by a 6-gal. flush

If all sewers were perfect in construction, perfect in form, and perfectly flushed, there would be no need probably for the intercepting trap, which would in that case be nothing but an obstruction to the removal of house drainage. But until that ideal condition of the sewers arrives, of the two evils—escape of sewer gas in the neighborhood of the house, and the slight impediment to the getting away of house drainage afforded by the trap—the first must be considered as decidedly the greater. Occasionally, no doubt, some nuisance arises from an intercepting trap, but so long as the sewers are worse laid and worse flushed than the house drains, intercepting traps are a necessity.

Those who wish to convince us that the trap is obsolete and had far better be abandoned, must, in order to carry their case, prove either one or the other of the following contentions:

They must either show that sewer gas is beneficial to health, or clearly demonstrate that the air in the public sewers is at least as good as the air in the house drains, and further prove that the intercepting trap is in every case an unmitigated nuisance. If it could be shown that sewer gas is beneficial to health, the necessity for the disconnecting trap, and in fact, all other traps,

disappears, for the difference between the disconnecting trap and the traps in the house is one of degree only, the difference consisting of the depth of the seal and the quantity of waste water retained.

It has been said that the intercepting trap is wrong in principle, and is no remedy or protection for a defective drain, and that it is liable to be forced at any moment. But taking it for granted that the true safeguard to the house and its inhabitants is a sound drain laid with a good fall, gas-tight joints, and properly ventilated by a full-sized pipe to above the roof of the house, two main principles must not be lost sight of; that prevention is better than cure, and that of the two evils, escape of sewer gas or sewer air in our houses (in confined positions) and escape of sewer gas in the streets (in positions not confined), the latter is the least.

There is much to be said with regard to interceptors on house drains. There are those of a bad form, and those which are badly set and so arranged that they are sources of danger.

Should Be Easily Cleaned.

In the first place it is important that the trap should be accessible for cleaning, and that the form of the trap should be such as to ensure that it will be thoroughly cleansed by a good flush. Another essential point is that makers still persist in supplying them with unsuitable stoppers for the cleansing eyes. I am aware there are exceptions, but generally, the stoneware stopper supplied is difficult to remove at a critical time, i.e., when the drain is choked, as it cannot be forced without damage to the trap itself; the removal proving a somewhat uncertain matter when the manhole is charged with sewage.

A piece of slate, cut to the size of the apparatus and lightly cemented around the edge so as to make it secure and water-tight, is a good substitute, being easily broken and replaced in cases of emergency, and it is less likely to be blown out by the sewer gases than the earthenware stopper—a not infrequent cause of stoppage in drains, but probably a matter of carelessness in fixing. There are various forms on the market, some of very good design, and as the objections to large manholes have long been recognized, there are ways and means of fixing other types than the ordinary "manhole" type. From an economical point of view, a trap as in sketch can be used with advantage, as with a curved junction placed on the trap itself a straight line of drainage can be kept, both to the sewer and also from the house, this is not possible where the "inlet" is fixed on the trap itself. It can also be adapted to saving a deep "dig" by inserting pipes between the trap, so placed as to meet the requirements of the sewer side of the trap and house drain.

Agitation for Abolition.

The question which has recently been raised by municipal engineers for the abolition of the intercepting trap appears to be not so much the objection to the trap itself, but because they wish to ventilate the sewers at the expense of the house drains. Their very reason for asking for its abolition was an argument against the proposal. If the sewers need so much ventilation the sewer gas must be decidedly objectionable, and should not escape in the neighborhood of houses. The object of the municipal engineers should not be to obtain general ventilation of sewers, but to improve them, and so flush them that no ventilation is needed excepting in those sewers where men work. These would have to be separately considered and special means taken for their ventilation, but not by tapping them at every house.

An eminent authority has said: "If large volumes of pure air were allowed to pass through a sewer in contact with sewage, they had large volumes of foul air escaping at some point, and that the great secret in sewer ventilation was not to encourage these currents of air through sewers, but to give such an amount of vent as should prevent any pressure being exercised upon the traps of houses so as not to allow any escape into the house itself."

This has of late gained very general acceptance, and an example may be taken in any slowly flowing dirty ditch which is altogether exposed to the open air. This complete ventilation does not abolish the smell, and moreover, it is not the duty of occupiers and owners to ventilate public sewers. Local authorities should therefore find a proper remedy, and not risk the menace to health which would be introduced if the intercepting trap were abolished.

I have spoken of the ventilation of sewers, and some of the objections pertaining thereto; but there is another side of the question, viz., the drain side, in which the so-called "fresh air inlet" is not an unmixed blessing, and the frequent enquiry as to where it shall be placed. The position of low level inlets seems to be of importance, because often the intercepting trap with its "fresh air inlet" has to be placed in front of a house and in the small property near windows and doorways. It is usual to carry it a little above head level so as not to become offensive in case of back draughts; but as we have the alternative method of taking the pipe to the top of the house, either from the front or the rear of the drain, it is often an advantage to take the ventilation pipe up the front of the house, placing the "fresh air inlet" at the rear, where often it can be placed so as to minimize any nuisance arising from it.

Another advantage of placing the ventilation pipe in the front is that the sewer gases which may be forced through the trap from the sewer, or emanating from stagnant water in the trap, immediately pass up the pipe without check or hindrance. The only disadvantage of this plan is the objection to the pipe being taken up in front of the house, this being in many persons' opinion "unsightly and ugly."

Experiments on Sewage Bacteria.

I will conclude by reminding you of the experiments carried out by Major W. H. Horrocks, R.A.M.C., and made to determine the conditions under which "specific bacteria derived from sewage may be present in the air of ventilating pipes, drains, inspection chambers, and sewers." As most sanitarians at the present time believe that when sewage is in a putrefactive condition gas bubbles bursting at the surface may cause bacteria to be carried into the air of drains and sewers, the experiments were made to ascertain whether there were any scientific facts on which to base these beliefs, and were divided into three groups, as follows:

Group I.—Experiments to determine whether specific bacteria are ejected into the air by the bursting of bubbles at the surface of sewage.

Group II.—Experiments to determine whether bacteria dried on the surface of pipes are likely to be separated and carried by currents of air passing through the system.

Group III.—Experiments to determine whether specific bacteria are ejected into the air of drains, sewers, &c., from sewage flowing under normal conditions; this last apparatus being specially designed to test the utility of the disconnecting trap between the house drain and sewer.

The results of these experiments are tersely summed up by Major Horrocks, as follows: That bacteria existing in sewage under natural conditions can be ejected into the air in the same manner as the naked bacteria used in the experiments, and

(1) Specific bacteria present in sewage may be ejected into the air of ventilation pipes, inspection chambers, drains, and sewers, by (a) the bursting of bubbles at the surface of the sewer; (b) the separation of dried particles from the walls of pipes, chambers and sewers, and probably by (c) the ejection of minute droplets from flowing sewage.

(2) A disconnecting trap undoubtedly prevents the passage of bacteria, present in the air of a sewer, into the house drainage system.

(3) An air inlet, even when provided with a mica valve, may be a source of danger when it is placed at or above the ground level.

This epitome of Major Horrocks' proceedings I have brought before your notice because it is closely allied with our every day business, and to abandon such a factor of safety in sanitary works as the disconnecting trap would not be logical, reasonable or justifiable. Properly constructed, rationally maintained, and combined with a good drain, it is a regulator of public health, and if an Englishman's house is his castle, why allow invasion by sewer gas, more than anything else?

A MEXICAN OPPORTUNITY.

A system of sewage and water works is being installed at Durango, Mexico. This city is one of the wealthiest in the country and, as the Government demands that every house be connected with the sewage system the work offers a demand for sanitary appliances, which must be met.

Advice from Durango has been published to the effect that a plumbing establishment has not yet been established in the city, any work previously done has been let to outside firms. In order to establish a business for accepting contracts, for providing sanitary appliances or in any business controlled by the Government, a concession must be secured, or an agreement made with a citizen of that country who has such an arrangement.

The work now started, offers a market for the supplies, which householders must have to make the required connections and to provide their buildings with sanitary appliances.

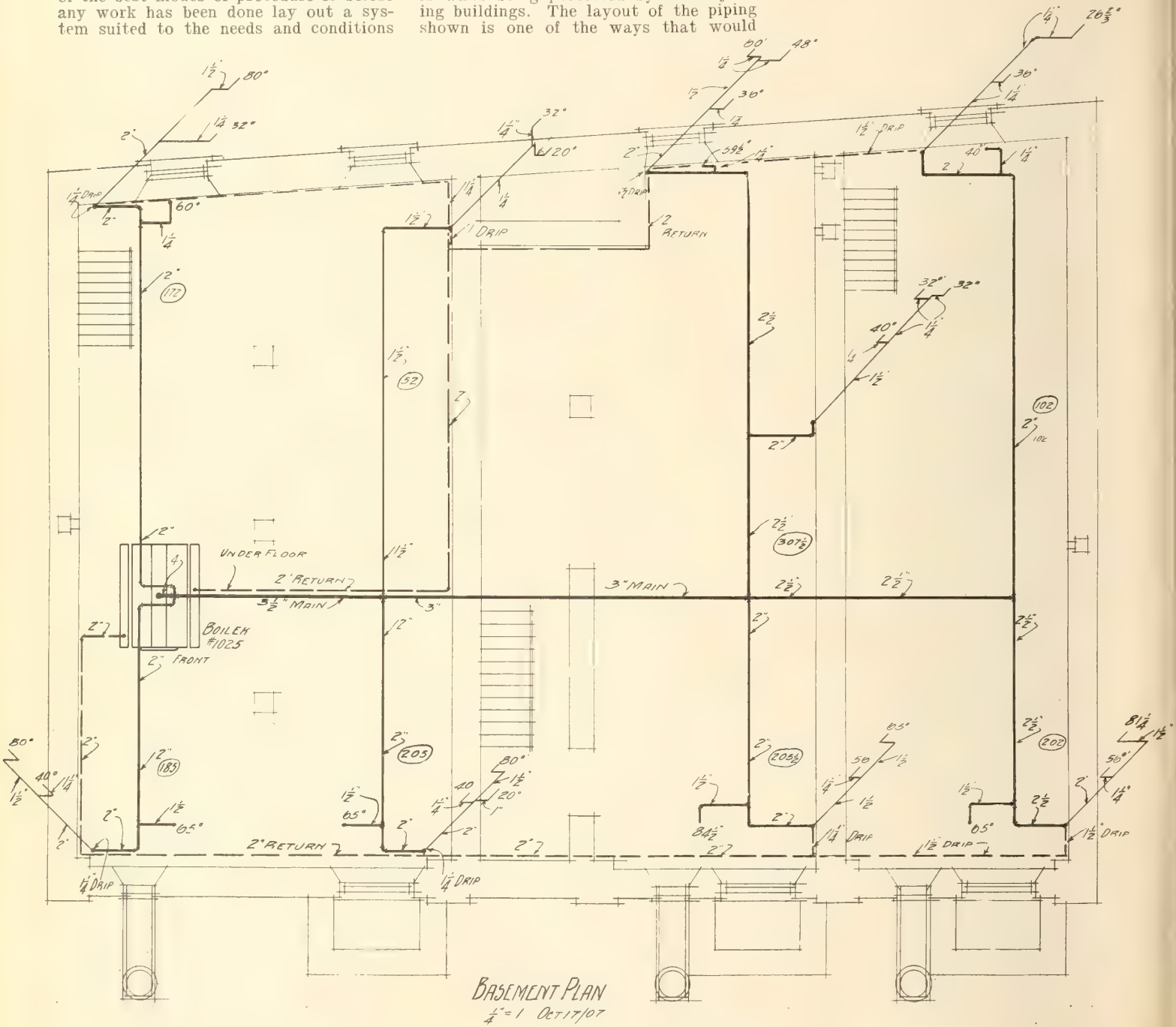
Steam Heating in Practice

Article V. Piping Systems.—By W. B. MacKay, Toronto.

There is probably no part of the design of a steam heating plant that has more to do with the economical installation and operation of the plant than the piping system, which may be economical as regards the material used but at the same time wasteful of fuel.

To get good results in every way one of the best modes of procedure is before any work has been done lay out a system suited to the needs and conditions of the building under consideration. It will save much time and it will be a help to the man in charge of the erection. No matter how crude the drawing may be, it is essential that all the sizes be marked plainly and in detail, so as to cause no doubt in the interpretation by the workmen when executing the work.

The example of a piping system outlined in the sketch and following paragraphs is somewhat different from the cases taken heretofore. The building is square, and the radiation is distributed along the front and rear sides, the other walls being protected by the adjoining buildings. The layout of the piping shown is one of the ways that would furnish a practical and economical plant in every way.



Piping System in Business Block.

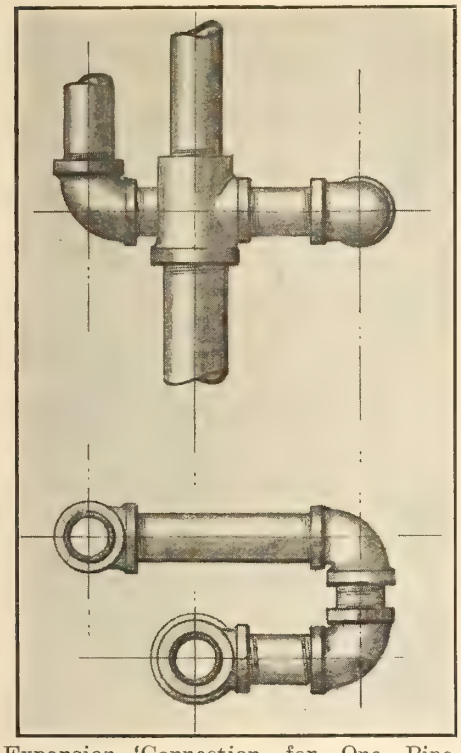
Large Pipe Causes Trouble.

Frequently the average heating man meets trouble when handling big pipe, not probably for the want of experience, but from the absence of adequate appliances for cutting and threading pipe over two inches in diameter. To this end, therefore, the designer should give attention to the capacity of the tools, etc., that will be used in the installation of the work. It will be seen from examination of the sizes marked on the piping plan, the amount of large pipe (over two-inch) is small, while the amount of small pipe is largely increased in comparison with other examples. This simplifies the labor question, for if the plan be reasonably accurate as regards the outline of the building, the

few pieces of pipe over two inches could be measured from the plan so as to be cut and threaded to the proper length while the first stages of the work of installation are in progress, thereby causing no delay.

Then again, smaller sizes of pipe may be used as the condensation is carried away by dripping the end of each branch but this itself must be regulated carefully so as not to cause friction, as such a result would be detrimental to the perfect balance of the system.

A system of piping, as illustrated by the sketch, will fill with steam more readily and with less inconvenience than a long circuit running from the boiler in the form of a loop. Another point which may be of interest is that there is perfect freedom for expansion. All the branches are taken up off the top with short nipples with a "tee" looking across the main, and a branch off each end of the "tee," The end of each branch is provided with an elbow-joint so that the piping has freedom to expand in every direction without any undue strain being placed on any of the



Expansion 'Connection for One Pipe System.

fittings. All risers should be provided with some sort of an expansion conneetion, an example of an expansion connection very often used being shown in the accompanying engraving.

Determining Size of Boiler.

Many men engaged in steam heating use no other method of determining the size of boiler than by studying a manufacturer's catalogue. This serves very well in most cases, but does not always answer.

An ordinary radiator of the two-bar type will condense about 3-10 lbs. of steam in a room at 70 degrees, when the pressure in the radiator is not more than 5 lbs. per square inch (which corresponds to 228 degrees Fahr. temperature of steam inside of the radiator), and each pound of steam contains approximately 1,000 British thermal heat units (B.T.U.). Knowing these facts, the amount of steam required can be readily determined.

Supposing there is a job with 1,700 square feet of radiation, 1,700x3-10 equals 510, the number of lbs. of steam required to supply the radiation only for the period of one hour, this amount of steam would contain 510x1,000 equals 510,000 B.T.U. approximately.

One pound of anthracite coal contains in the neighborhood of 14,500 British thermal units; of this about 9,000 is the net amount available in the ordinary firing under an economical type of boiler. It is much safer, however, to use 8,000 as the basis of estimating. so that, using the example chosen, 510,000 divided by 8,000 equals 64 pounds of coal required.

The ordinary type of low-pressure steam boiler burns fuel at the rate of about six pounds per square foot of grate surface per hour, so that 64 lbs. divided by 6 equals, approximately, 11 square feet of grate surface necessary.

Allowance for Mains.

Throughout this calculation the mains, etc., have been neglected, it being necessary to add for the loss by the mains and branches anywhere from 20 to 35 per cent., according to conditions, so that to heat 1,700 square feet of radiation with about 30 per cent. allowance for mains, a boiler with about nfteen square feet of grate surface would be required.

If the type of boiler to be used is a tubular boiler, such as are used for power purposes, one horse-power is considered equal to 100 square feet of radiation gross.

The ordinary run of boilers have the proportion of about 190 to 200 square feet of gross radiation to the square foot of grate surface in the boiler.

Again, as all boilers are usually rated for 70 degrees at zero, when lower temperatures are to be contended with, it will be seen from the preceding that boilers for these extreme conditions are not so powerful as the catalogues state. The manufacturers have in many cases neglected to state in their catalogues the basis upon which the ratings were figured, evidently believing that the 70 degrees and zero basis was an understood fact.

DRAFT OF A CHIMNEY.

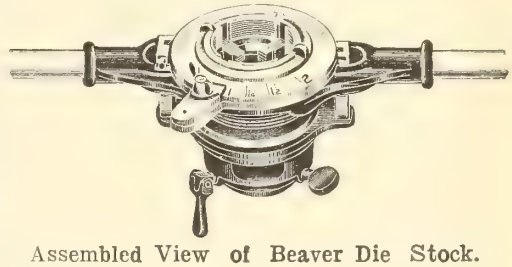
The draft of a chimney is entirely due to the difference in the weight of the hot air in the chimney and the cold air outside of it. The hotter the air is on the inside of a chimney and the hotter the inside of a chimney can be kept and the higher the chimney is, the stronger will be the draft at the stove pipe hole. It is very important that no air enter the chimney flue except that entering from the stove. The man who is sent out to set up a stove often does not have this fact impressed sufficiently strongly upon his mind.

One way of testing a flue is by lighting a piece of paper and holding it in the stove pipe hole. If it is drawn in and up the flue easily there is evidence that the draft is in the right direction, even though the chimney may not be large enough or the draft strong enough to operate the large stove with a large fire in it and a large body of fuel.

If the lighted paper burns downward it is safe to depend on it that there is trouble at the bottom of the flue. If the flame is drawn in and up, so that the smoke hovers above the stove pipe hole in the chimney and then comes down and possibly turns and goes up again, the trouble is at the top of the chimney.

BEAVER DIE STOCK.

The die stock here illustrated differs from the ordinary die stock in the manner of setting the tool for different sizes of pipe. By changing the lever on the dial plate on a No. 2 Beaver stock, the chasers are set to thread four different sizes of pipe, 1 in., 1¼ inch, 1½ inch and 2 inch. A cam with four slots open up the four segments to cut the different sizes. These four segments have each three full threads, and thus the area of the cutting surface is small. The cam and dial plate are held rigidly together by means ofa clamp with thumbscrew. By a simple mechanical principle they automatically recede while threading to form the tapered thread, so that they cut less depth with each turn. Small lugs on the dial plate travel in slots in the side post. These slots are 16 degrees from the perpendicular, so that the segments recede from the centre, giving a pine-taper of ¾ inches to the foot. The first tooth of each chaser takes a roughing cut, each succeeding tooth cuts a little deeper and the last tooth makes a finishing cut forming an especially clean and perfect thread. A ring locks the side post and rear nut together. Bushings are inserted in the rear nut for different sizes of pipe. A top-locking nut holds the different parts together. Two thumbscrews and one drop-handle screw fasten the rear nut to the pipe. Chips and grit cannot work in because the tension screw collar prevents and takes up all looseness and wear. Should the pipe split the dies can be released by shifting the lever. The Beaver die stock, in six sizes, ranging from ¼-inch to 12-inch, are manufactured by the Borden-Canadian Company, 66 Richmond street, east, Toronto.



Assembled View of Beaver Die Stock.

Application has been made by the municipality of Parry Sound to the Ontario Railway and Municipal Board for confirmation of a by-law authorizing the extension of the electric light and waterworks.

NEWS OF THE TRADE IN CANADA

A new post office will be erected at Welland.

A waterworks system will be installed at Port Moody, B.C.

Duquette & Bissenette, plumbers, Montreal, have dissolved.

W. G. Dean, Toronto, will erect a residence to cost $12,000,

Conroy Bros., plumbers, Montreal, have dissolved partnership.

G. E. Alexander, Toronto, will erect two dwellings to cost $8,000.

A. B. Brown, Toronto, will erect two brick dwellings, to cost $7,000.

Thos. McIllwain, Toronto, will erect two dwellings at a cost of $6,000.

W. Nash, Toronto, will erect three brick dwellings in Toronto, to cost $7,500.

E. R. Diamond, Toronto, will erect one pair of brick dwellings, to cost $6,000.

During the past year $120,000 has been expended on buildings at Prince Albert, Sask.

Tenders for a waterworks system for the village of Ste. Therese, Que., are being called for.

D. J. Warwick, Toronto, has moved to North Toronto, and will conduct a plumbing business.

The council of Kelowna, B.C., has passed a by-law to raise $40,000 for a waterworks system.

A. J. Small & Co. are contemplating the erection of a $200,000 "Grand" opera house in Ottawa.

J. S. Carter, Amherst, N.B., has leased a store in Sackville, N.B., and gone into the plumbing business.

Jas. Watt & Sons, Chatham, are remodeling the steam heating system in the Roman Catholic church at Wallaceburg, Ont.

The Sisters of St. Joseph are contemplating a $40,000 addition to St. Joseph's hospital, London. Plans of the addition are being prepared.

The contract for the new Church of England cathedral, in Halifax, has been awarded to S. M. Brookfield. The cost of the building will be $125,000.

Collingwood has applied to the Ontario Municipal and Railway Board for the confirmation of a by-law to raise $3,800 for waterworks extension.

R. O. Miller, Gravenhurst, who recently purchased the business in that town conducted by Aaron Child & Son, expects to establish a plumbing department in the near future.

The article on the clearing of waste pipes from sinks, in The Plumber and Steamfitter of Nov. 20, was reproduced from the Engineering Review, credit for the article being omitted in error.

The Montreal Hygiene Committee have bought land on the corner of Mentana and Marie Anne streets, consisting of 6,030 feet, at a cost of $4,824, for the purpose of erecting a public bath for the north end of the city.

Engineer Davis and the Waterworks Commission, Chatham, have brought in their report, in which they recommend the expenditure of $125,000, to install a system of pure drinking water and an efficient fire protection. This $125,000 will also make provision for the laying of new mains and house services to the extent of $5,000 or $6,000 next year, which, of course, does not properly belong to the total cost of installing the plant.

The Dominion Wire Manufacturing Co., Montreal, are installing a 75,000 gallon gravity tank on steel structure with underground mains for fire protection for their premises, the work being done by the H. G. Vogel Co., Montreal.

Crump & Perrier, plumbers, Halifax, the owners of a valuable business site on Barrington street, have commenced the erection of a brick building thereon. The new structure will be of two storeys and will contain three stores on the ground floor.

A new heat transferring apparatus has recently been invented in Italy by U. Croizat. The apparatus consists of a series of plates, formed with openings in the centre and provided with wide flanges. The plates are arranged to be nestled together and may be used as radiators in any place where it is desired to transmit heat from gases to liquids, or vice versa. The apparatus may be readily adapted to the use of the automobile or gasolene boat.

Action for the infringement of the firm name has been brought by the Standard Sanitary Manufacturing Company, Pittsburg, against the Standard Ideal Company, Port Hope. The amount of damages claimed is $5,000, and an application will in all probability be made for an injunction. In the declaration filed by Messrs. Trihey, Bercovitch & Kearney, Montreal, it is set forth that both firms are manufacturers of baths, sinks and lavatory articles and supplies generally, and that the assumption by the defendant of the term "Standard" registered previously by the company plaintiff, is of a nature to prejudice the business of the plaintiff, and has already caused inconvenience and loss to the plaintiff.

At the preliminary meeting under the winding up order granted the Canada Radiator Company, of Lachine, Que., Alexandre Desmarteau, accountant, of Montreal, being the liquidator, five inspectors were appointed to inquire into the affairs of the company. The inspectors are: James L. Waldie, secretary-treasurer of the Montreal Rolling Mills; James T. McCall, of Drummond McCall, Montreal; John A. Richardson, manager of the Imperial Bank of Canada, Montreal; A. McLaren, secretary to Senator Robert Mackay, and O. Constantineau, banker, of Montreal. A statement of the affairs of the company will be issued in due course.

SUCCESSFUL HUNTING TRIP.

W. Linton, traveling representative of the Standard Ideal Co., of Port Hope, and W. J. Atkinson, office manager of the Monarch Brass Co., Toronto, who recently returned from a hunting expedition spent in the Temiskaming district are shown in the cut on this page, with some of their trophies, the skins in the cut being taken from three wolves and a fox shot near the Wahnipatae river. In addition, the hunters bagged a large black bear, several deer and a fine moose. The hunters are well pleased with their trip, and will claim $45 from the Government, which is the bounty paid for the wolf heads.

Two Plumbing Supply Men and the Results of their Marksmanship.

Mr. Linton, who led the party, is becoming famous amongst the trade for his hunting exploits, as well as popular for the souvenirs he brings home annually, as many friends as possible being remembered with steaks of venison or other reminders. The chief trophy won this year was a magnificent moose head, one of the finest yet seen in Toronto. This Mr. Linton is having mounted, along with other trophies of his prowess.

PLUMBING AND HEATING MARKETS

TORONTO.

Toronto, Dec. 3.—Business in brass goods and plumbers' supplies generally continues to be of the sorting order variety, and the usual end-of-year dullness appears to have settled upon the trade. Jobbers have now had an opportunity to sum up November sales and the overwhelming consensus of opinion among local managers is that trade for this November has fallen far short of the aggregate business transacted for the corresponding month of last year. Buying for future delivery continues to be practically at a standstill, owing to the disturbed state of the financial markets, and to the fact that many retailers still persist in buying only for immediate requirements, in the hope that quotations generally will be lower later on.

Iron Pipe—The heavy demand for the most popular plumbing sizes still continues, but supplies of the smaller sizes have somewhat improved since last writing, and some jobbers have been fortunate enough to receive large shipments during the past week. Among the larger sizes, however, 2-inch and 2½-inch are very scarce, as instanced by the fact that during the week one local jobber offered a premium of 2c per foot for a limited quantity of 2-inch pipe, but was unable to obtain it. Prices are firm, as follows : ⅛-in. black pipe, $2.-90 ; ¼-inch galvanized, $3.75; 1-inch black, $5.60 ; 1-inch galvanized, $7.25.

Soil Pipe—There is little activity in the market for this commodity, most retailers having stocked up well in soil pipe, while quotations were low. Jobbers are still holding to the October list. Present prices run as follows :— Medium and extra heavy pipe and fittings, up to 6-inch, 70 per cent.; 7 and 8-inch pipe, 40 per cent.; light pipe, 60 per cent.; fittings, 60 per cent.

Lead Pipe—In sympathy with the tone of the British pig lead market, this commodity shows a tendency to weaken in price. Little business is being put through and the market may be said to be stationary. Lead pipe is still quoted at 5 per cent.

Solder—A good average demand exists, for the first week in December. Wiping solder is quoted at 22c, and half-and-half at 24c.

Cast Iron Fittings—December business in fittings has opened out fairly well and supplies are in a satisfactory condition. Fittings are quoted at 60 per cent.

Radiators and Boilers—The heavy call for radiators continues unabated, and manufacturers have all they can do in keeping pace with the trade. Radiator prices continue firm and unchanged. Boilers are in fair demand, and supplies in the larger sizes are well up to requirements. There has been quite a run on the smaller sizes during the past fortnight and supplies of these are much lower as a result. Boilers are still quoted at from 50 to 50 and 10 off list.

Brass Goods—Prices are weak and there is little vitality to the market. Compression work is quoted at 60, and basin cocks 55 per cent.; fuller work is held at 65 per cent. off list. Ground work quotations run as follows ; Bibbs, 15; roundway, 50, and flatway work 50 and 10 per cent.

Enamelware—Sales have fallen off slightly during the past fortnight, and orders are now mostly for enamelware in sorting quantities. The September price list is still in vogue.

Metals—Canadian iron markets remain firm at $21.50 for Middlesboro No. 3. Lead prices are weakening, though the local price as yet remains unchanged, at $4.90 for bars. In old materials, the market is weak and buying is at a low ebb.

MONTREAL.

Montreal, Dec. 2.—All lines in plumbing materials are moving freely, and trade generally is in a satisfactory state, especially considering the time of the year. The customary slackness of the winter months has not yet been felt owing to the prolongation of the building boom. Although outside work except in the centre of the city, is practically over, there is much inside fitting to be done, especially in the case of those buildings which were rushed up during the fall. Plumbers are anticipating a busy time for some weeks to come. Jobbers generally are satisfied with the state of affairs, and congratulate themselves that the reflex of the building boom has helped to off-set, to a certain extent, the panicy state through which the country is passing. They are not inclined to hazard an opinion as to the state of trade next year, as building operations may, or may not, be badly affected by the conditions of affairs now prevailing. At one time prospects were very rosy, but rumors of building propositions falling through for next year are somewhat insistent. Still there is ample time for the recovery of that confidence in the prosperity of the country which should never have been lost.

Radiators and Boilers.—These lines are in good demand, and have not yet felt the slackness usually prevalent around December. In fact, radiators are moving with astonishing briskness, and manufacturers say they are getting more business than they can manage. These lines naturally feel the after-effects of the building boom. There is no scarcity, so far as boilers are concerned. Manufacturers are well stocked to meet the demand. Quotations are still 50 per cent. off, and there is no probability of any change until next year.

Soil Pipe—The demand is now quiet, and will be so until the building operations commence again. Manufacturers are holding full stocks, and are able to meet any call. We quote : Medium and extra, 70, and light, 60 off.

Steam Fittings—Demand is active, and manufacturers are amply stocked. We quote, 60 off.

Enamelware — Trade still continues good. Jobbers are now commencing to place their orders for next year, and the factories anticipate a busy time in coping with them.

Brass Goods—Although there are rumors of a drastic cut in one or two lines, prices generally are still maintained. The demand is good. Special lines are selling well. We quote standard compression work at 57½ to 60, and fuller work, 70 per cent.

Iron Pipe—The scarcity in iron pipe still continues. The demand is good, and we continue to quote : 1-in. black pipe, $6.10 ; 2-in. black, $13.32 ; 1-in. galvanized, $7.91 ; 2-in. galvanized, $17.-24.

Lead Pipe—Business is brisker in this line. Prices are firm at 7c per pound, less 5 per cent.

Metals—Prices have been shaded slightly in some cases in sympathy with the drooping tendency of the metal market. Bar lead is quoted $5.50; pig iron unchanged at $21.50 for Middlesboro No. 1, and $20.50 for No. 2 ; Summerlee, $25.50 ; ingot tin, $36.50 to $37 ; ingot copper, 16c ; sheet zinc, $7 to $7.25. Heavy scrap red brass is 11½c ; light copper, 10c ; heavy lead, 3c.

CONDENSED OR "WANT" ADVERTISEMENTS.

RATES.

Two cents per word first insertion ; one cent per word subsequent insertions.

Five cents additional each insertion where box number is desired.

Contractions count as one word, but five figures (as $1,000) are allowed as one word.

Cash remittances to cover cost **must** accompany all advertisements. **In no case** can this rule be overlooked. Advertisements received without remittance cannot be acknowledged.

RULES FOR COPY.

In addressing replies care of PLUMBER AND STEAMFITTER don't fail to give box number.

Replies addressed to PLUMBER AND STEAMFITTER boxes are re-mailed to advertisers every Monday, Wednesday and Friday.

Requests for classification will be followed where they do not conflict with established classified rules.

Orders should always clearly specify the number of times the advertisement is to run.

All "Want" advertisements are payable in advance

FOR SALE.

PLUMBER'S Cabinet for sale, cost $75, stands nine feet high and is 6 feet wide, contains 68 drawers, ranging in size from 3 in. x 3 in. to 6 in. x 18 in. Am installing larger cabinet, otherwise would not think of selling. Box 649, Plumber and Steamfitter, Toronto.

BUSINESS CHANCES.

OFFICE space wanted by manufacturer in Toronto : state location and terms. Box 645, Plumber and Steamfitter, Toronto.

SITUATION WANTED.

WANTED by practical plumber, steam and hot water fitter, of 16 years' experience, thoroughly conversant in both trades mentioned, position as manager or foreman ; can handle work and men to advantage. Would like to communicate with firms requiring same. Box 23, PLUMBER AND STEAMFITTER, Montreal. (27)

Assignee's Sale

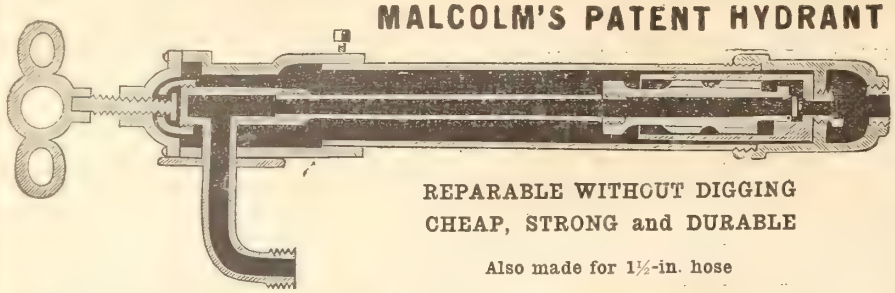
THE time for receiving tenders for the sale of the assets of The Canadian Boiler and Radiator Company, Limited, has been extended by the Trusts and Guarantee Company, Limited, the Assignee, until noon of the 14th inst. The assets will be sold either *en bloc* or in separate parcels. They include :

Real Estate and Buildings	**$6,201.50**
Raw Material	**5,021.96**
Moulding Shop Equipment	**1,909.75**
Machinery and Tools	**2,725.78**
Pattern Shop Equipment	**1,345.40**
Stock Finished	**719.00**
	$17,923.39

Immediate possession can be given. The property is well and conveniently situated, with a railway siding running alongside the building. The buildings are new, of white brick, built on a concrete foundation which extends four feet above the ground. There are about three acres of land. The plant and machinery are well adapted for a general machinery and foundry business, and particularly for the manufacture of hot water boilers for heating purposes.

The lowest or any tender not necessarily accepted.

For further particulars apply to the Trusts and Guarantee Company, Limited, James J. Warren, Managing Director, Assignees, 14 King Street West, Toronto.



MALCOLM'S PATENT HYDRANT

REPARABLE WITHOUT DIGGING
CHEAP, STRONG and DURABLE

Also made for 1½-in. hose

MALCOLM & CO. TELEPHONE MAIN 5101 **64 Lombard St., Toronto**

Plumbers !

Will You Increase Your Knowledge ?

J. J. COSGROVE'S BOOK

PRINCIPLES AND PRACTICE OF PLUMBING

will be sent you postpaid on receipt of $3. This is the most complete treatise ever written or published on plumbing and sanitation, giving rules and formulas for doing work on an exact scientific basis instead of by "guessing," and covers the sanitary requirements of all classes and sizes of buildings. It is a RAPID SELLER, because it is a practical book for practical men. ORDER NOW, as the first edition is ALMOST ALL SOLD.

TECHNICAL BOOK DEPARTMENT

MacLEAN PUBLISHING CO., 10 Front St. E., TORONTO

Backed by a Guarantee

All our **Bronze** Powders and **Liquids** have the distinction of being **Guaranteed.** All plumbers and Steamfitters know the necessity of having the **Best** in Bronze Powders and Liquids.

OURS NEVER FAIL

The Canadian Bronze Powder Works, Montreal & Toronto

No order too large **Works at Valleyfield** If your nearest dealer does not handle our goods, write us.

INSTALL THE

ONLY BRASS GOODS

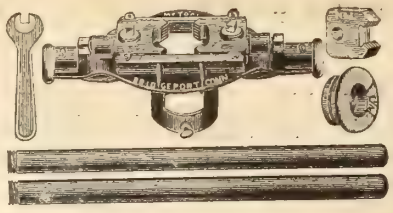
MADE

GUARANTEED 5 YEARS

They make good customers

Glauber Brass Mfg. Co.

CLEVELAND, OHIO, U.S.A.



The Armstrong Manufacturing Co.

317 Knowlton St., - Bridgeport, Conn.

Manufacturers of the Genuine Armstrong Stock and Die, Malleable Iron Hinged Vises, Pipe Cutters, Pipe Wrenches, Bard Adjustable Bushings, Ratchet Attachment for Stock, Pipe Threading and Cutting-off Machine--Hand and Power. Our goods are sold by all Jobbers.

CATALOGUE MAILED ON REQUEST

WHY?

Why is the **BUSY MAN'S MAGAZINE** the best publication in the magazine field?

Simply because each issue contains in addition to its original articles, the Cream, the Choicest and Best articles appearing in all other magazines and periodicals. Not only do the best articles in your favorite magazine appear in Busy Man's, but the live-up-to-date ones appearing in SCORES of publications which do not come your way.

Think of how interesting, entertaining and instructive this many-in-one magazine must be. Not a dull page in it; every page SELECT.

A post card giving us your address will bring you a free sample copy and the unsolicited testimony of dozens of our readers.

We will send the Magazine till January 1st, 1909 (14 issues) for $2, the price of one year's subscription. This offer only holds good while the Christmas Number lasts.

SEND US YOUR ORDER TO-DAY.

THE

BUSY MAN'S MAGAZINE

TORONTO

Let Our Beaver Do Your Work.

You Don't Have to Change Dies.

Cuts 1, 1¼, 1½ and 2" perfect threads, all with one set of chasers

RAPID WORKER

The Hand Stock that Starts Easy and Finishes Easier.

"The New Way."

You Will Find it a Sure-enough Beaver.

Write for our special 10-day trial offer

You cannot afford to take the time to thread pipe by hand in any other way

Other sizes of Beavers will soon be born—¼ to ¾—2½ to 4—4½ to 8—8 to 12

Manufactured by

Borden=Canadian Company

166 Adelaide Street West, Toronto

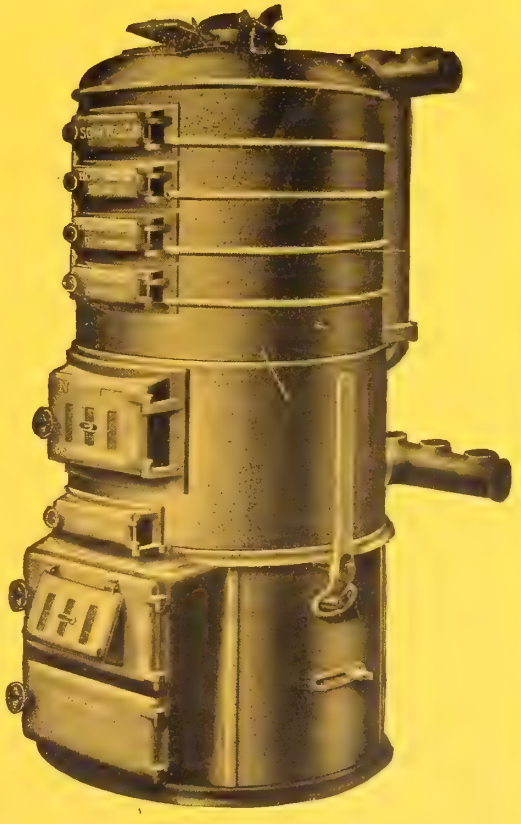
A "Sovereign" Point

that is to say, a point of excellence found in no hot water boiler save the "Sovereign" is the enlarged first boiler section, with a corresponding enlarged first section of the water post. This makes the water circulation through the

"Sovereign" Boiler

faster than in any other boiler on the market preventing the water from coming to a boil. This is one of the many reasons for the superiority of the "Sovereign" System of house heating over all others.

Our little booklet "Simplified Heating" which we will send you free upon request, will tell you of many other good points.



TAYLOR-FORBES CO., LIMITED

Head Office and Works: GUELPH, ONT.

TORONTO—1088 King St. MONTREAL—122 Craig St. W.

WINNIPEG—The Vulcan Iron Works, Limited

ST. JOHN, N.B.—H. G. Rogers, 53½ Dock St. QUEBEC, QUE.—The Mechanics Supply Co.,
VANCOUVER, B.C.—Boyd, Burns & Company

Standard Ideal Cast Iron Porcelain Enameled Ware

is so constructed as to meet the requirements of the Canadian Trade. Dealers in plumbing equipment will find this Ware a splendid business getter. Standard Ideal Porcelain Enameled Ware ensures perfect sanitation and satisfies critical householders.

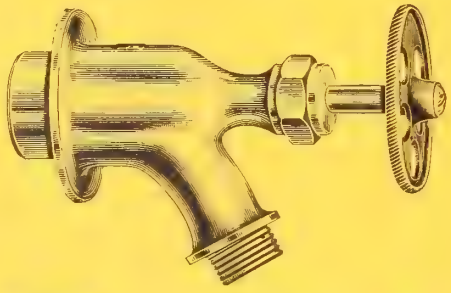
We Manufacture Bath Tubs, Sitz Baths, Shower Baths, Lavatories, Urinal Ranges, Slop Hoppers, Laundry Tubs, Sinks, Closet Ranges, Steamship Supplies, Railway Car Supplies, Hospital Appliances.

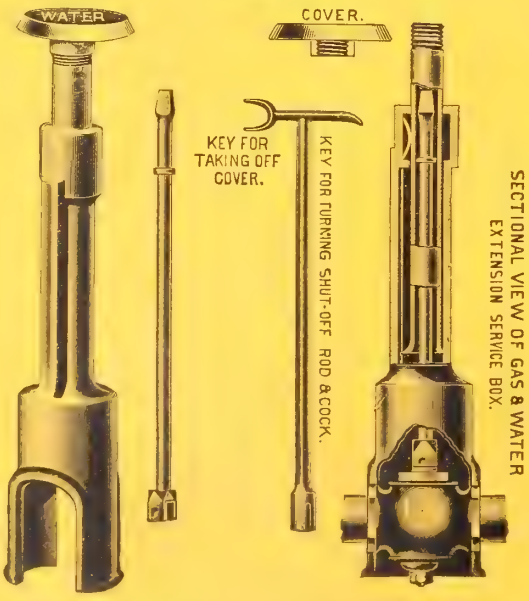
THE STANDARD IDEAL COMPANY LIMITED

Head Offices and Factories, - PORT HOPE, Ont.

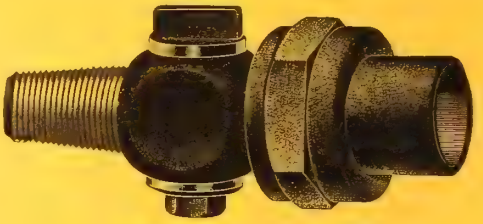
Sales Offices and Sample Rooms: TORONTO, 50 Colborne St. MONTREAL, 128 West Craig St. WINNIPEC, 156 Lombard St.

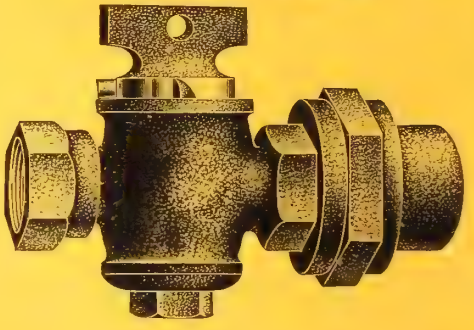
(517)





Fittings That Don't Disappoint





For

Plumbing, Water, Gas and Steam

Hays Manufacturing Co.

Complete Works: - - - ERIE, PA., U.S.A

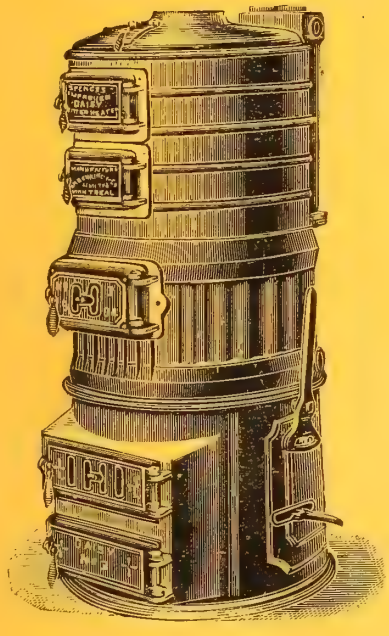
PLUMBER & STEAMFITTER OF CANADA

THE MACLEAN PUBLISHING COMPANY, LIMITED, PUBLISHERS

MONTREAL, 232 McGill St. TORONTO, 10 Front St. E. WINNIPEG, 511 Union Bank Bldg. LONDON, ENG., 88 Fleet St. E.C.

Vol. I. No. 18. (New Series). Publication Office : 10 Front St. East, TORONTO, DEC. 18, 1907. Old Series, Vol. XIX. No. 28

THE DAISY BOILER



Most Steamfitters know that the greatest economy in hot water heating lies in the use of the DAISY Boiler. For a quarter of a century this heater has led the way in hot water boiler construction.

There is more than sentiment back of the DAISY'S success. If it wasn't better than its competitors; if it wasn't able to do all we claim it will it would not be foremost in public favor to-day.

The DAISY embodies every feature in its construction that is recognized by engineering science to give it the greatest heating efficiency with the least possible fuel consumption and attention.

All sizes in stock for immediate shipment.

CLUFF BROTHERS

LOMBARD STREET, TORONTO

SELLING AGENTS FOR WARDEN KING, Limited

The James Robertson Company LIMITED

Beg to announce the opening of their

NEW SANITARY EXHIBITION ROOMS

AT

66 Beaver Hall Hill

MONTREAL

We cordially invite you to visit this Exhibition and inspect our extensive range of the finest examples of Modern Sanitary Appliances.

METROPOLITAN CLOSET OUTFIT

BEST COMBINATION
IN THE WORLD.

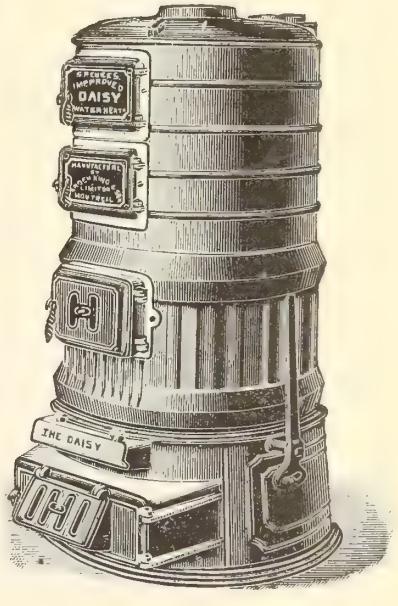
SOMERVILLE LIMITED

59 RICHMOND STREET EAST - TORONTO

Honest Ratings

The ratings of the Daisy Boiler are thoroughly honest and conservative. Every size has been carefully tested and its power accurately estimated, so that in figuring, the steamfitter is positive in gauging boiler capacity according to the published ratings. You will not be obliged to take out a Daisy.

Write for Catalogue.



CLUFF BROTHERS

Lombard Street, TORONTO

Selling Agents for **WARDEN KING & SON, Limited**

The Monarch Brass Mfg. Co., Limited

WISH THEIR NUMEROUS CUSTOMERS

A Merry Christmas

and

A Happy New Year

To make your year bright and prosperous keep up the habit of using "MONARCH" COCKS and VALVES. We will continue to make them a little better than the best.

Office and Warehouse - - - - 278 Dundas St., Toronto

YULETIDE GREETING.

WE hope that at this glad Christmas time you may forget your cares, your business, your enemies, your doubts and sorrows and feel in spirit and in fact that gentle influence of the day which awakens in the hearts of the people of all civilized nations, "PEACE ON EARTH, GOOD WILL TOWARD MEN."

H. MUELLER MFG. CO.

Eastern Division
NEW YORK CITY
254 Canal St., Cor. Lafayette.

Works and General Offices
DECATUR, ILL.
West Cerro Gordo St.

MORE DEPARTMENTAL STORE COMPETITION

From both Toronto and Montreal come reports of departmental stores slashing prices in plumbing supplies.

A fortnight ago we reported the selling of 30-gallon galvanized range boilers at $3.99 by a Toronto store. The manufacturers apparently brought trouble upon themselves by selling the departmental at jobbers' prices, or better, without securing a guarantee that the goods would not be retailed in the regular way. The sequel is a reduction of prices to master plumbers, the manufacturers having to stand the drop in selling prices.

The Toronto departmental, which has been retailing plumbing supplies for about a year, evidently content with the usual profits, has followed up the range boiler incident with a slash in flat rim 18x30 enameled sinks, advertised at $1.95, the product, we understand, of an Eastern Canada foundry. The price of these, recently quoted to jobbers, was $2.10 in car loads, f.o.b., point of manufacture, so it is evident that by selling in single lots at $1.95 in Toronto, the price is extremely low even though the goods are a by-product of a foundry and an unsalable poor quality of seconds, the class of goods usually unloaded on the public in this kind of sale. The retail trade and public should be protected by having these second grade goods marked as such in fair sized letters.

It may be interesting to discuss the ethics of a business concern which sells range boilers to some customers at $6 and the next day or next week disposes of the same goods to other customers at $3.99. Why hold up one customer for $6, if the goods can be sold for $4, and if the goods cannot be sold at a profit for $4, why sell them at this figure, regardless of the business interests of the manufacturers and the master plumbers? This kind of business morals may suit the departmental store magnates who are too holy to sell playing cards, but the much maligned master plumber certainly conducts his business on a basis more equitable to his customers.

Discussing this ethical question, the president of the Toronto Master Plumbers' Association writes as follows:

> Editor Plumber and Steamfitter: Sir, Competition, fairly and honestly applied, is the fundamental basis of present business life, but mistakes have been made, and are being made in its application.
>
> When a business man sells staple articles of merchandise 13 per cent. below the manufacturers' price to jobbing houses, and 26 per cent. below the jobbers' price to retail buyers, the business man must charge an exorbitant price to his regular customers in order to give some customers goods 13 per cent. below his cost, plus his own expenses of selling these articles, which would be an additional sum.
>
> Again, is the manufacturer treating the jobbing houses, or retail men fairly? Has he got a price for some buyers to encourage them to sell his line of manufactured articles so much below market prices that the store selling below market prices can still show a profit on his advertisement? If this is possible, then the cure would be for other men to compete wherever possible in order to secure from the manufacturer a square deal. If the manufacturer is selling his goods at an inflated profit because he is protected by a heavy import duty, he should at least give the people who pay him this protection some consideration in return, by giving all supply and retail houses the opportunity of meeting the present unjust competition of one who must be on the inside. If these articles are being sold at a loss of 13 per cent. on cost, plus 10 per cent. for selling, it must follow that in the nature of business life, it will react to the first producer of the article —the manufacturer. Then, if that order follows in natural law, does it now also follow in business law.
>
> The manufacturer of an article should be able to control its retail selling price on a basis of equality; failing that, refusing his manufactured articles to any man who is not depending on selling this line of ware, for the success of his business, but merely using him as a tool to develop the sale of other lines where he makes sure of a profit large enough to pay for the loss in other lines.
>
> LEWIS LEGROW.
>
> Toronto, Dec. 16, 1907.

Mr. Legrow's arguments are reasonable and will be approved of by master plumbers generally. The subject will stand further discussion, however, and space will be given for any additional contributions sent the editor for publication.

ANOTHER TRIBUTE TO CANADA.

In ordinary times our United States friends have refused to take Canadian paper money excepting at a large discount, but in the last few weeks concerns across the line have been pleading with Canadian customers to send them Canadian bank bills instead of cheques in payment of accounts. The result is that there is an immense amount of Canadian money now in circulation in United States. In the border towns for a couple of weeks there was very little currency, other than Canadian, obtainable. The Americans, too, seem to have much greater faith in our banks than in their own, for immense sums of money have been pouring in during the last few weeks for deposit in the banks in the border towns. In all it is estimated that ten million dollars have been withdrawn from U.S. banks in the border towns and deposited in Canadian towns. One man arrived two weeks ago from Philadelphia, with $212,000 in cash, in a hand bag, which he deposited in a Toronto bank. There is good ground for the faith they have in Canadian institutions. In the severe depression of 1893, when hundreds of United States banks went under, there was not one banking failure in Canada. The few banks that have failed in the last 20 years have been small, with one exception, and even then depositors have in nearly all instances been paid in full.

USE OF SPARE TIME.

During the winter the plumber can make active use of his time by refitting his shop and office and in studying from trade literature and technical works, devoted to such subjects, as heating, ventilation, sewage and water systems and many others which will prove of value to him in his business.

The successful plumber must keep up with the times and as methods for doing the different branches of his work are constantly undergoing changes, it is essential, that he should by careful reading, get as thorough a knowledge of up-to-date ideas for conducting his business as is possible.

In the busy season the business of the plumber requires all his time, leaving little for reading, but during the winter months, all knowledge which he may gather from carefully compiled technical works is sure to bear fruit, in the next season's business.

Modern Conveniences for Farm Homes

The Seventh of a Series of Articles Intended to Help Canadian Plumbers in Educating Residents in Country Districts to the Necessity of Better Sanitary Arrangements.

By Elmina T. Wilson, C.E.

Heating Systems.

The health and comfort of the home depends to a considerable extent upon the heating apparatus, which, in importance, is second only to that of sanitary plumbing. Stoves are a development of the fire-places of our ancestors. Their waste of fuel, their uncleanliness, and their inability to properly heat even one room are features recognized by most people. The ideal heating apparatus is one that will promptly and continuously supply every room in the house with enough warm fresh air to make it comfortable in the coldest weather. It must be easy to manage and not complicated in construction. The cost of installing a steam or hot-water system is more than that of a hot-air furnace. The amount of fuel used by them is less, but for a small house the hot-air furnace is most often used. It has the advantage, too, if properly installed, of supplying fresh air, while the other systems demand special means for ventilation, or dependence must be placed entirely upon opening the doors and windows.

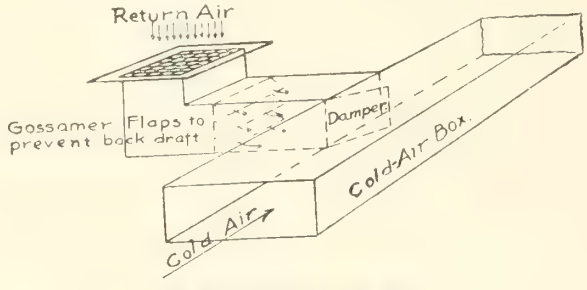


Fig. 20 -Return Air Pipe.

Furnaces.

A furnace is a stove within a casing of galvanized iron or brick. Air is admitted to the space between the two and when it becomes heated passes through pipes to the different rooms of the house. The furnace may be constructed of cast iron, wrought iron, or steel. The cast-iron furnace has fewer joints than the one made of steel plates and will not vary in temperature so rapidly.

In construction there are two styles, the "direct" and the "indirect" draft. The better class of the "direct" draft furnaces have a radiator through which the hot gases pass on their way to the smokestack and so utilize much heat that would otherwise be lost. In the "indirect" draft furnaces the gases pass through radiators at the bottom and from there to the smokestack. A direct passage is furnished to be used when the fire is being started or when coal is being added. Some furnaces are "built to sell" by their size and are not furnished with a radiator. These will burn more fuel and give off less heat.

The smoke pipe should connect to the chimney as directly as possible, for elbows diminish the draft. The flue should be at least 8 inches by 12 inches and should have no other opening into it for range or fireplace. A clean-out door should be provided at the bottom, fitted with a tight door, and this door must be kept shut, except when cleaning out the flue.

The grate is one of the most important parts of a furnace, and there are many kinds to be had. The essential things are the removal of the ashes and cinders from the entire grate surface without carrying unburned coal with them, and the admission of air to secure proper combustion of the fuel. In comparing furnaces the average diameter of the fire pot is taken. The space above must be large enough to permit of the thorough mixing of the gases with air or else much heat will be lost by imperfect combustion. If soft coal is to be burned a larger combustion chamber is needed than with hard coal, as the supply of air must be greater.

Furnaces differ in the manner of bringing the air to be warmed into contact with the surfaces heated by the combustion of the fuel. The area of the heating surfaces should be about 60 times the area of the grate surface to prevent overheating of the air in cold weather.

Where natural gas is available the furnace can be arranged to burn it, but it is well to have a coal grate also in case the gas should be shut off. Wood furnaces are generally more simple in construction and are often built to take a 4-foot stick. Where wood is cheap excellent results may be obtained. The smoke should pass through a radiator, as in case of coal furnaces.

Distribution of Hot Air.

Much depends upon the location of the furnace. It should be placed somewhat to the north and west of the centre of the house—that is, toward the prevailing cold winds. As the hot air travels best through the pipes leading toward the sheltered part of the house and to the upper rooms, the pipes leading toward the north and west or to the rooms on the first floor should be given the preference with respect to length and size. Make all pipes as nearly the same length as possible and as short as the location of the registers will permit. Long horizontal runs of pipe should be avoided, especially in first-floor pipes. The pipes should pitch upward as sharply as possible so the resistance will be less. Each pipe should have a damper near the furnace. Each room should have a separate pipe, if possible, or the heat will go to the less-exposed room when a wind is blowing. Exposed pipes should be provided with an asbestos covering, even when made double; double pipes are the best for all work. Bright tin is almost always used for hot-air pipes, as it radiates less heat than any other suitable material. The registers should be as near the furnace as possible. Nothing is gained by putting them on the exposed side of the room and much heat is lost. First-floor registers may be placed in the floor if wall registers would interfere with the pipes to the second floor. Second-floor registers should be placed in the wall so as to avoid the necessity of cutting carpets and not to furnish recepacles for dirt. If only the first floor is heated the registers should be placed in the wall. The net area of the register should be about 15 per cent. greater than the section of its hot-air pipe.

The size of the room and whether it is a bedroom or living room; the run of pipes, whether short or long, straight or crooked, vertical or horizontal, should all be considered in determining the size of the hot-air pipes. Pipes can be too large, but more often they are too small. When in doubt, use the larger size. For first-floor rooms up to 12 feet square and 10-foot ceiling, 9-inch pipes should serve; for larger rooms up to 14 feet by 16 feet with 10-foot ceilings, use 10-inch pipes; and for rooms still larger, 12-inch pipes. Sleeping rooms and bathrooms on the first floor need 8-inch pipes. If any pipe is poorly located a size larger should be used.

The Cold Air Supply.

The cold-air supply pipe should be made of galvanized iron, as it will then be dust and fire proof and more durable than if made of wood, which cracks and admits the dust and the close air of the cellar. If it is made of wood, matched boards should be used and the wood should be stopped at least a foot from the furnace. The size of the cold-air pipe is often made equal to three-fourths the combined area of the hot-air pipes, as air expands when heated It should never be smaller than this and might be made of the full area of the hot-air pipes. If not enough cold air is supplied, the pipes leading to the sheltered side of the house will take all the air and even draw down air from registers on the windward side. In attempting to warm these unfavorably located rooms in extreme weather the air must be overheated, which is hard on the furnace. In localities where zero

weather is frequent a pipe is often provided to return the air of the house through the furnace. The area of this pipe should be equal to the combined areas of the hot-air pipes. This pipe is not to take the place of the fresh-air inlet, but can be used part of the day without harm. If used at all, it must be used intelligently, or else the saving of fuel is at the expense of health and comfort. When a return-air pipe is used, it often joins the fresh-air inlet pipe, as shown in figure 20. If this combination is installed, the pipe is full size from the furnace to where the inside supply pipe is connected and three-fourths size from there to the outside air. Both pipes should be provided with dampers. It is often necessary to shut off part of the cold air supply to start the fire, but the full supply should be turned on as soon as possible or the air will be taken from the cellar or from some of the registers. If it is found that some registers do not deliver enough warm air while others supply too much, the dampers can be adjusted to cut off part of the flow from rooms that have more than their share, which will throw it into the less favored pipes.

Rooms having fireplaces are more easily heated than others. All rooms not having fireplaces should have ventilators with pipes of half the size of the warm-air inlet and pipe, the opening being near the ceiling on the same side of the room as the warm-air inlet, but as far as possible from it. All these pipes should unite in the attic and have a common outlet, preferably surrounding the chimney, as the heat from the smoke flues will induce a draft.

If the furnace is of sufficient size and is properly located and the fittings well put up, it should give no more trouble than a single stove, while the risk of fire is much less. The satisfaction of a warm house, especially of warm floors, cannot be counted in dollars and cents.

An arrangement for regulating the dampers by hand can be placed in any convenient room on the first floor, which will reduce the labor of caring for the furnace by half, or an automatic temperature regulator can be used, which will not only secure an even temperature with less fuel, but will avoid the strain on the furnace caused by forgetting to close the dampers after the fire is started until reminded of it by the excessive heat of the room. An alarm clock with a ratchet or gear arranged to trip a lever and allow the weighted damper to open is often used to turn on the drafts in the early morning.

If the house has a fireplace or two, it is not necessary to use the furnace so early in the autumn or so late in the spring, as a small grate fire in the mornings removes the chill from the rooms with less expenditure of fuel. A good fireplace is a precious possession.

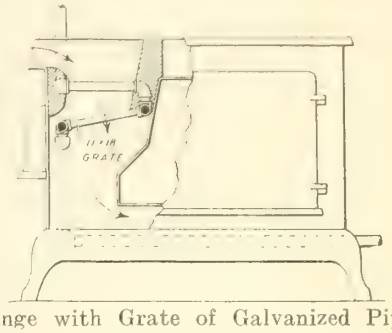
Hot Water Heating From a Range

The amount of heating which can be done from a cooking apparatus under favorable conditions is surprising. A heating system of this character can be studied and analyzed with some interest. An installation of the kind described in a recent issue of the Metal Worker, was made by H. O. Curtis & Co., Gardner, Mass., in a flat on the second floor of a building which was already heated.

The range from which the heating was done is known as the Nemo. In general appearance it closely resembles the regulation square oven range setting on feet and having a skirt base and an ornamental warming shelf. The peculiar features of the construction are the arrangements by which the draft can be either directed up through the grate, as is the usual custom, or it can be shut off from this point and the draft passed downward from the top of the fuel to the bottom and through the water grate which supports it, and through flues under the oven, from whence it rises in the regular way.

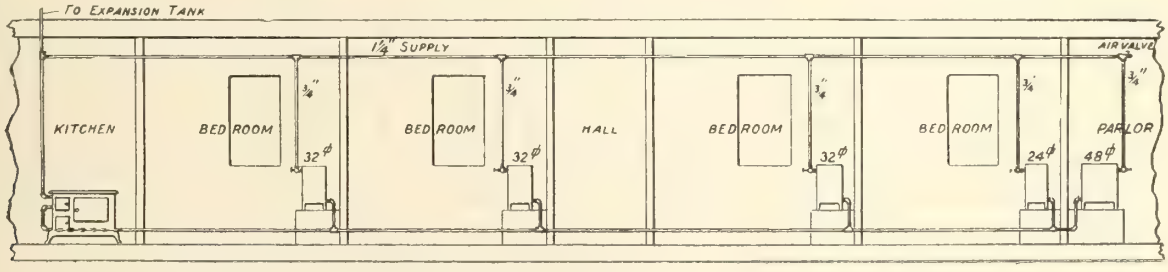
The range has a firebox 11x18 inches, and the grate, instead of having the customery castings, is made of galvanized iron pipe, the two outer bars being $1\frac{1}{4}$ in. pipe and the connecting bars being $\frac{1}{2}$-in. pipe, so that it exposes a surface of at least 4 square feet. Being filled with water, it makes no difference which way the products of combustion pass or how hot the fire lying on the grate may be, it is not in danger of being burned out, but the hotter the fire the more the water is heated and the better the circulation through the radiators. The water-back for supplying hot water for domestic purposes is a casting as usual, and is connected with the boiler independently of the heating system.

Running up from the pipe grate a $1\frac{1}{4}$-inch flow main runs along the ceiling, with radiators in four bedrooms and in the parlor, presenting an aggregate surface of 168 feet. In connection with the exposed surface in the flow main and the falling mains to the radiators the total radiating surface exposed is about 200 feet. With 4 square feet of surface in the grate and 200 feet of surface in the radiators, each sq. ft. of heating surface in the pipe grate must carry about 50 feet of radiating surface. This would seem extraordinarily large were it not for the fact that the part of the building to be heated is above a floor which is already heated and the floor above it again is heated, so that the duty imposed upon the water heater is less than if it was on a ground floor and had to supply all the heat lost by the building.



Range with Grate of Galvanized Pipe.

The drops to the different radiators are $\frac{3}{4}$-in. in diameter, and the radiators used in the bedrooms present 32 square feet of surface, excepting the front chamber, which has the 24 square feet radiator, and the parlor, which has a 40 square feet radiator. Valves are placed on the different radiators, so that any one may be shut off when it is not needed. Provision is made for expansion by means of a very small pipe, which connects with the water supply pipe with the building by means of a branch from the return at the lowest point. At this point there is little danger of any of the hot water backing into the hot water service pipe to the bathroom or any flow from the heating system to supply the other fixtures. In fact, if there is any excessive cooling in the radiators or piping the domestic hot water supply system may serve to supplement it and give some assistance. The system has been in operation through two winters with apparent satisfaction to the occupants of the apartment.



Scheme of Heating a Flat from the Kitchen Range on Same Level.

NOW SHIPPING RADIATORS.

The King Radiator Co.'s plant at Toronto is now in successful operation with practically all the machinery in place. Shipments of radiators have commenced and work is in full swing. A description of the new the Dominion Radiator Co., Toronto, is in full swing. A description of the new plant will probably be published in the next issue of Plumber and Steamfitter. S. W. Howard, formerly of the Dominion Radiator Company, Toronto, has been appointed secretary-treasurer of the King Company.

Evolution of House Ventilation

E. D. Sidman, in Building Management.

The question of the proper amount of pure air, or ventilation for the human being is as old as human life itself, but up to within a few generations, the manner of living and the methods of building construction were such that artificial or rather mechanical ventilation was not necessary, except in a few instances, in which unknowingly our forebears provided as good a system of natural ventilation as could be devised, as many of the old buildings in London, Rome and other old cities will testify.

The question of pure air is practically the question of life itself, as no other single thing connected with our lives has so much bearing on the health, general welfare and longevity of the human race as this subject.

In the far ancient times when people lived almost entirely in the open air, sleeping in caves, scanty shelters of brush or in the open, doing their cooking over the open "camp fire," and depending on it for what heat that was necessary to sustain life, the people lived to a fabulous old age, notwithstanding the dangers and lack of care these primitive people had to contend with, and neither ancient history nor modern research shows any trace of their ever having any lung or throat trouble among them.

Next came the construction of buildings, mostly stone or adobe, loosely thrown together, guiltless of close fitting doors or windows, and either depending for cooking on the fire outside, or one made in the centre of the room with a hole through the roof to carry off the smoke for cooking, but the people still practically living in the pure open air.

Then some old "Wiseacre" conceived the idea of building a flue or chimney to carry off the smoke, and make the cooking and heating more convenient, and the open fire place was born, and the first and one of the best means of ventilation was erected, and while this old open fire place is not an ideal heating apparatus, for cheerfulness and as a ventilator to carry off foul air it has never been excelled.

Water Boiling Over Fire.

There was still another factor in the lives of these ancients that aided their general health and long lives, that is closely allied to heat and ventilation, namely, humidity, living in the open or at the best in loosely constructed buildings, they had at all times nearly the relative humidity that nature intended for them, and in the cold months when shut up at times as tightly as was possible in their poorly built houses, you would find pots of water simmering over the fire, and furnishing the extra humidity that was needed.

The question often arises as to who taught these people the need of humidity? Their system of ventilation was involuntary, and the benefits of it unknown to them, but to have a kettle of boiling water in a closed room was an acquired act, and one that has lasted among some people till this day, and for some kinds of heat is as good a means as could be devised to get humidity.

But we have only to go back a few years to see how the simple life in the open air prolongs life. A peep into the history of our own pioneers, shows that despite the awful privations and scanty fare that they were constantly subjected to, that these brave, pushing men lived to a ripe old age, and kept their faculties to the end.

Introduction of Stoves.

The next event in the evolution of heat, to the almost complete elimination of ventilation, was the stove, which is relatively speaking quite modern, a curious fact being that steam heat was used long before them, and on the stove gaining prominence receded until a few years ago.

The first American stoves were an oblong box, made of cast iron held together with bolts, long enough to take 3 or 4 foot wood (then the almost universal fuel) about 2 feet wide and high, mounted on four legs, with a door in front, sliding cover to an ash pan hearth, a small opening in the top at the rear for smoke pipe, and usually witha griddle hole in the middle of the top.

At this time it seems ludicrous to us that anything so simple as this old box stove should make such a furore and cause so much discussion as it did at the time it was invented, yet it is a fact that some people would never use them, claiming that if they were not possessed of the devil they were at least too unsafe to harbor. A verse from an old song published in the 50's entitled, "Twenty Years Ago," shows this feeling.

"Well do I remember that Wilson patent stove
That father bought and paid'ed for in cloth our gals had wove
And how the neighbors wonder'd when we got the thing to go
And swore 'twould bu'st and kill us all some Twenty Years Ago."

Poor Ventilation Causes Disease.

But the stove was there to stay, although at this period they were mostly used for heating only, the cooking and baking being generally done in the fire place or dutch oven, but when used you would generally find a kettle of water simmering away on the back of the stove. To see that this old box or the round sheet iron stove is still in evidence, it is only necessary to enter most any farm house in New York or the New England States where they still have wood to burn.

The stove filled a long-felt want, was modified and improved rapidly, and at the present time is heating a large percentage of our homes, and outside of the fire place, the writer knows no more cheerful sight than a glowing anthracite base burner on a cold and stormy night.

While the stove was and is useful, we might say necessary as a source of heat, it has had more to do with the spread of and development of tuberculosis than any one agency, from the fact that it was stoves that taught the people the desire for overheated rooms, both day and night with all its unhealthiness, and from the fact that 99 per cent. of the homes and buildings heated by stoves have no provision for ventilation whatever, except the doors and windows, and when they are opened, which is seldom together, they create such a draught as to do more harm than good, and the people hug the stove and breathe over and over an air almost devoid of humidity, and laden with carbon dioxide.

FAN VS. CHIMNEY.

Compared with a stack or chimney for producing air movement the fan shows remarkable superiority. The relative efficiency of a fan and a stack or chimney under ordinary working atmospheric conditions is shown in the following table:

Relative Efficiency of a Fan Blower and a Stack Discharging Air from the Top. Outside Temperature, 60° F.

Height of stack in feet.	Number of times fan is more efficient than stack. Where fan engine exhaust is wasted.	Where fan engine exhaust is utilized.
30	20	350
40	15	260
50	12	210
60	10	175

Even at ordinary speed a fan produces a pressure different so much in excess of that created by a heated stack that far larger volumes may be moved at increased velocity. With internal air as high as 200 degrees and outdoor air at 50 degrees, a stack would have to be nearly 600 feet high to produce the same pressure as is created by a fan at ordinary speed.

The importance of ample air circulation in the drying process is recognized by all. March has always been considered one of the best months for drying. With the stack it is evident that circulation can only be secured by actual waste of heat to the atmosphere, for it is the temperature of the escaping air that governs the velocity. Hence there is a two-fold increase in the waste; the air is both greater in volume and also higher in temperature. With the fan, on the other hand, additional air volume costs practically nothing, for all

PLUMBING AND HEATING MARKETS

MONTREAL.

Montreal, Dec. 16.—A slackening off is noticeable in most lines. Combined with the usual quietness felt at this period of the year, there is the reactionary effect of the trade depression, and although the plumbing trade is brisk, considering all things, the purchasing of supplies is slow. A waiting policy is now being observed, and this will be maintained until the new year opens out and gives some indication as to the trend of trade generally. Everything is depending upon the monetary situation. It is evident that building operations will be very active once confidence returns, but contracts are at present being kept back. Whether the money market will rally in time to set work going at good pressure in the spring is now the point of doubt. There is an impression that in the new year the banks will circulate money more freely, and if this surmise turns out to be correct, the plumbing trade will feel the effect as much as any industry. The work is there, the prospects are there, and the only drag is the one of money.

Radiators and Boilers—The demand has fallen off with the completion of the fall building operations, and there will be very little doing from now on until March opens out. Business for November has been well up to average, and manufacturers are thankful that the financial depression was too late to affect the building trade for the latter part of the year. There is no change in the price of radiators. Stocks in boilers are fairly full, and holders are well able to meet the demand, especially as there is now as we have said, a falling off. Quotations are still 50 per cent. off.

Soil Pipe—There is very little doing in soil pipes. Stocks are full enough to meet any demand, and prices are firm at: Medium and extra, 70, and light 60 off.

Steam Fittings—The demand is not as active as it was, and is feeling the effects of the general slackening. Stocks are ample. We still quote 60 per cent.

Enamelware—Orders from the jobbers are not coming in so freely as they did last year, but it is expected that the demand in the new year will make up for the deficiency. At any rate manufacturers are relying on a heavy demand. Lines are not moving so freely from stock, but trade is fair for the time of the year. Prices are unchanged.

Brass Goods—These goods have felt the continued weakness of the copper situation, and there has been a shading in values from 5 to 10 per cent. An attempt is being made to cut the market here, but so far there has been no material reduction in any of the well known lines. Even with the price of copper as it is, quality of material and style of workmanship cannot permit of much lower figures than those which at present obtain. We still quote standard compression at 57½ to 60 and fuller work 65 to 70 per cent.

Iron Pipe—The demand continues satisfactory, but the drawback of shortness in certain sizes is still being felt. Prices are firm, and we continue to quote: 1-in. black pipe, $6; 2-in. black $13.32; 1-in. galvanized, $7.91; 2-in. galvanized, $17.24.

Metals—The market generally is in a weak state. Cutting in prices has not induced buying in the world's market, and thus the weakness is intensified. Pig iron is unchanged at $21.50 for Middlesboro No. 1, and $20.50 for No. 2; Summerlee, $25.50; ingot tin, $33; ingot copper, 15c. Heavy red scrap brass is 11c, light copper 10c, heavy lead 3c, scrap iron $12, No. 2 cast $10.

TORONTO.

Toronto, Dec. 17.—The usual December dullness has settled on the local plumbing market. After a fairly busy season, marked by high prices, local jobbers are at present receiving only small orders of the sorting variety. Buying for future delivery continues practically at a standstill, master plumbers persisting in ordering for immediate needs only.

The past two weeks have seen a sharp decline in lead, tin also has been brought steadily lower and though a drop in brass goods is being looked for prices to date remain firm.

Iron Pipe—The heavy demand for iron pipe which has existed all fall is dropping off, though a steady demand still exists for the popular sizes. Manufacturers will have a chance to catch up to the demand, however, during the next few weeks, before booking for spring delivery is under way.

The demand for the larger sizes is rapidly dropping off, many jobbers having received large shipments since last writing. Prices remain firm, as follows: ¼-in. black pipe, $2.90; ¼-in. galvanized, $3.75; 1-in. black pipe, $5.60; 1-in. galvanized, $7.25.

Soil Pipe—There is little demand at present for this commodity, most buyers having stocked up when quotations were low. Jobbers are still holding to the October list. Prices remain as follows: Medium and extra heavy pipe and fittings up to 6-inch, 70 per cent.; 7 and 8-inch pipe, 40 per cent.; light pipe, 60 per cent., and fittings, 60 per cent.

Lead Pipe—The situation of the British pig lead market has had the effect on the local market predicted, and a sharp decline in the various products has resulted. Lead pipe and waste is now quoted at 10 per cent., with caulking lead 5½ cents per pound, and traps and bends quoted anywhere from 50 to 60 per cent.

Solder—The market for solder is suffering a relapse, the demand has been good all fall but has suddenly dropped dead. Prices have declined sharply since last writing and wiping solder is quoted at 18½c with half and half at 21½c.

Cast Iron Fittings—December business in fittings opened well and is holding its own with the market. Supplies are in a satisfactory condition. Fittings are quoted at 60 per cent.

Radiators and Boilers—In this market a fair demand continues. Prices are firm and unchanged. The demand for boilers, particularly the small sizes, is still heavy and stocks are getting low. Boilers are still quoted at from 50 to 50 and 10 per cent. off list.

Brass Goods—A drop in this market is predicted, though at present jobbers are keeping the prices up. There is little doing on the market at present. Compression work is still quoted at 60 per cent. and basin cocks at 55. Fuller work is held at 65 per cent. off list. Ground work quotations run as follows: Bibbs 45, roundway 50, and flatway work 50 and 10 per cent.

Enamelware—Sales have been brisk during the past fortnight, but orders remain noticeably small. The September prices are still in force.

Range Boilers—Prices have been cut to $4.50 on 30-gallon galvanized boilers as a result of the slashing in prices by a Toronto departmental store a fortnight ago. Master plumbers can now buy half a dollar cheaper and the manufacturers seem to be the one's chiefly affected by the unloading of their goods through the departmentals.

Metals—Canadian iron markets remain firm at $21.50 for Middlesboro No. 3. Lead prices have suffered a sharp decline during the past week. Pig is quoted at $4.50 and bars at $4.75. Tin has also declined, while copper is about the same, quoted at about 14½c. In old materials the market is weak and buying slow.

CONDENSED OR "WANT" ADVERTISEMENTS.

RATES.

Two cents per word first insertion; one cent per word subsequent insertions.

Five cents additional each insertion where box number is desired.

Contractions count as one word, but five figures (as $1,000) are allowed as one word.

Cash remittances to cover cost **must** accompany all advertisements. **In no case** can this rule be overlooked. Advertisements received without remittance cannot be acknowledged.

RULES FOR COPY.

In addressing replies care of PLUMBER AND STEAMFITTER don't fail to give box number.

Replies addressed to PLUMBER AND STEAMFITTER boxes are re-mailed to advertisers every Monday, Wednesday and Friday.

Requests for classification will be followed where they do not conflict with established classified rules.

Orders should always clearly specify the number of times the advertisement is to run.

All "Want" advertisements are payable in advance

FOR SALE.

PLUMBER'S Cabinet for sale, cost $75, stands nine feet high and is 6 feet wide, contains 68 drawers, ranging in size from 3 in. x 3 in. to 6 in. x 18 in. Am installing larger cabinet, otherwise would not think of selling. Box 649, Plumber and Steamfitter, Toronto.

BUSINESS CHANCES.

OFFICE space wanted by manufacturer in Toronto: state location and terms. Box 645, Plumber and Steamfitter, Toronto.

SITUATION WANTED.

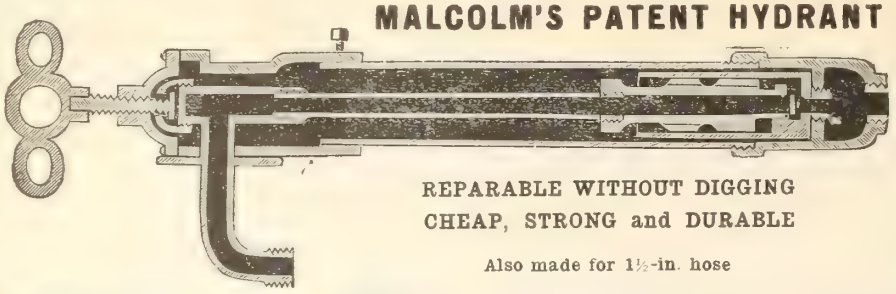
WANTED by practical plumber, steam and hot water fitter, of 16 years' experience, thoroughly conversant in both trades mentioned, position as manager or foreman; can handle work and men to advantage. Would like to communicate with firms requiring same. Box 23, PLUMBER AND STEAMFITTER, Montreal. (27)

SITUATIONS VACANT.

WANTED by practical plumber, steam and hot water fitter of 16 years' experience, thoroughly conversant in both trades mentioned, position as manager or foreman; can handle work and men to advantage. Would like to communicate with firms requiring same. Box 23, PLUMBER AND STEAMFITTER, Montreal. (27)

WANTED—A good tinner on furnace work, capable of doing plumbing work. Year round job to the right man. Address Box 436, North Bay, Ont. (17)

MALCOLM'S PATENT HYDRANT



REPARABLE WITHOUT DIGGING
CHEAP, STRONG and DURABLE

Also made for 1½-in. hose

MALCOLM & CO., TELEPHONE MAIN 5101 **64 Lombard St., Toronto**

INFORMATION

about every conceivable subject finds its way into the newspapers. The function of THE CANADIAN PRESS CLIPPING BUREAU is to collect **ALL** the items of information appearing in Canadian newspapers about any subject **YOU** are interested in. Our service is thorough. We don't miss an item. If you want **ALL THE CURRENT INFORMATION** about a pet subject, we can supply it at the lowest cost. By using our service you can **KEEP POSTED** on any subject.

WRITE FOR OUR FREE BOOKLET.

THE CANADIAN PRESS CLIPPING BUREAU,

232 McGill St., Montreal — 10 Front St. E., Toronto

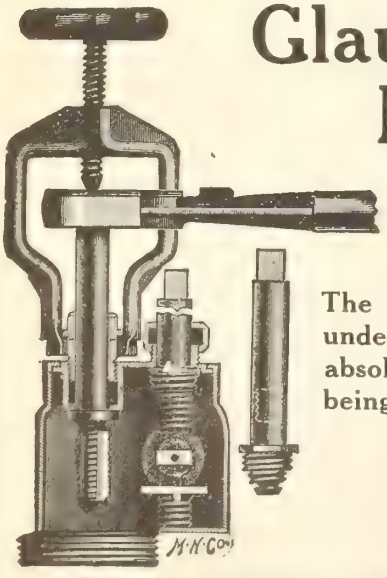
Backed by a Guarantee

All our **Bronze** Powders and **Liquids** have the distinction of being **Guaranteed.** All plumbers and Steamfitters know the necessity of having the **Best** in Bronze Powders and Liquids.

OURS NEVER FAIL

The Canadian Bronze Powder Works, Montreal & Toronto

No order too large — **Works at Valleyfield** — If your nearest dealer does not handle our goods, write us.



Glauber Tapping Machines

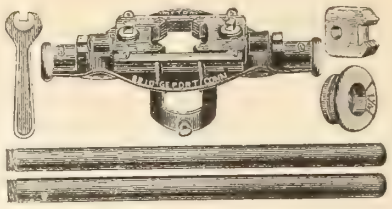
FOR ANY KIND OR MAKE OF CORPORATION COCK.

The only machines that do the work under the heaviest pressure and are absolutely proof against accident while being operated.

SENT ON 30 DAYS TRIAL.

Guaranteed 5 years.

GLAUBER BRASS MFG. CO.,
CLEVELAND, OHIO, U.S.A.



The Armstrong Manufacturing Co.

317 Knowlton St., - Bridgeport, Conn.

Manufacturers of the Genuine Armstrong Stock and Die, Malleable Iron Hinged Vises, Pipe Cutters, Pipe Wrenches, Bard Adjustable Bushings, Ratchet Attachment for Stock, Pipe Threading and Cutting-off Machine--Hand and Power. Our goods are sold by all Jobbers.

CATALOGUE MAILED ON REQUEST

WHY?

Why is the **BUSY MAN'S MAGAZINE** the best publication in the magazine field?

Simply because each issue contains in addition to its original articles, the Cream, the Choicest and Best articles appearing in all other magazines and periodicals. Not only do the best articles in your favorite magazine appear in Busy Man's, but the live-up-to-date ones appearing in SCORES of publications which do not come your way.

Think of how interesting, entertaining and instructive this many-in-one magazine must be. Not a dull page in it; every page SELECT.

A post card giving us your address will bring you a free sample copy and the unsolicited testimony of dozens of our readers.

We will send the Magazine till January 1st, 1909 (14 issues) for $2, the price of one year's subscription. This offer only holds good while the Christmas Number lasts.

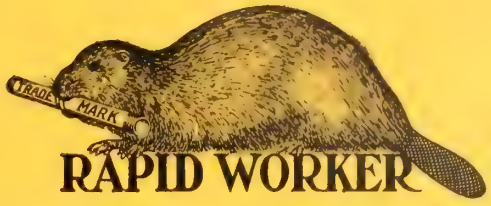
SEND US YOUR ORDER TO-DAY.

THE
BUSY MAN'S MAGAZINE
TORONTO

Let Our Beaver Do Your Work.

You Don't Have to Change Dies.

Cuts 1, 1¼, 1½ and 2" perfect threads, all with one set of chasers



RAPID WORKER

The Hand Stock that Starts Easy and Finishes Easier.

"The New Way."

You Will Find it a Sure-enough Beaver.

Write for our special 10-day trial offer

You cannot afford to take the time to thread pipe by hand in any other way

Other sizes of Beavers will soon be born—¼ to ¾—2½ to 4—4½ to 8—8 to 12

Manufactured by

Borden=Canadian Company

166 Adelaide Street West, Toronto

It is generally admitted that the

"Sovereign" Heating System

familiarly known as Simplified Heating, is by far the most economical on the market.

"SOVEREIGN" RADIATORS

go far towards explaining this fact. They have a larger heating surface per loop, while the larger connection to all admits a free and easy circulation.

"Sovereign" Radiators are artistic in design and we can supply them to harmonize with any scheme of house decoration.

TAYLOR-FORBES CO., Limited

Head Office and Works: GUELPH, ONT.

TORONTO—1088 King Street West.
ST. JOHN, N.B.—H. G. Rogers, 53½ Dock St.

MONTREAL—122 Craig Street West.
QUEBEC, QUE.—The Mechanics Supply Company

WINNIPEG—The Vulcan Iron Works, Limited.
VANCOUVER, B.C.—Boyd, Burns & Company

DEALERS IN PLUMBING EQUIPMENT HAVE A PRACTICAL GUARANTEE

of larger profits and greater satisfaction in handling

STANDARD IDEAL CAST IRON PORCELAIN ENAMELWARE

Made in Canada from designs calculated to meet every requirement of the trade. It is a ware that gives perfect satisfaction wherever installed.

We make Bath Tubs, Sitz Baths, Shower Baths, Lavatories Urinal Ranges, Slop Hoppers, Laundry Tubs, Sinks, Closet Ranges' Steamship Supplies, Railway Car Supplies, Hospital Appliances, Etc'.

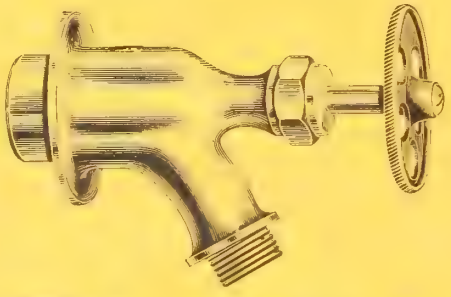
Write for Catalogue

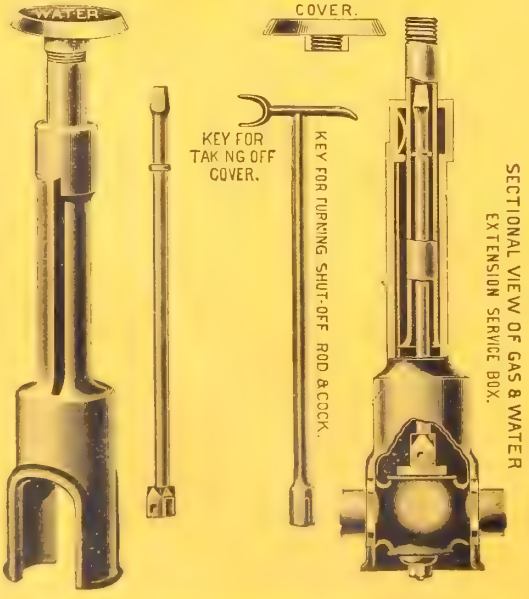
THE STANDARD IDEAL COMPANY LIMITED

Head Offices and Factories, - PORT HOPE, Ont.

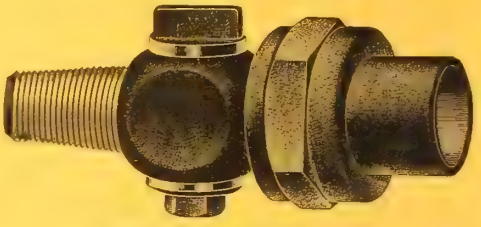
Sales Offices and Sample Rooms: TORONTO, 50 Colborne St. MONTREAL, 128 West Craig St. WINNIPEG, 156 Lombard St.

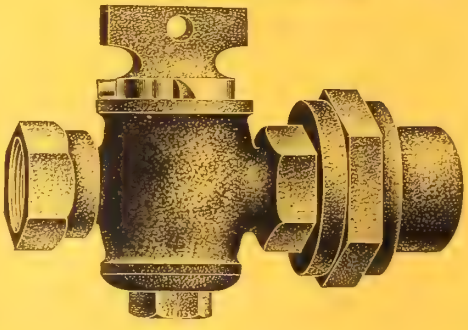
(516





Fittings That Don't Disappoint





For

Plumbing, Water, Gas and Steam

Hays Manufacturing Co.

Complete Works: - - - ERIE, PA., U.S.A